OPERATION AND MAINTENANCE MANUAL

AILTECH
BROADBAND AMPLIFIERS

EATON Advanced Electronics

Eaton Corporation
Electronic Instrumentation Division
Los Angeles, California 90066

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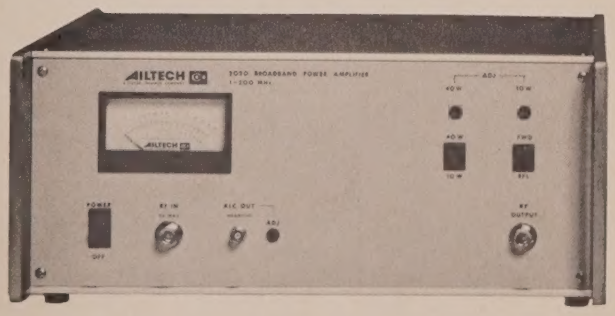
INSTRUCTION MANUAL FOR

AILTECH

BROADBAND AMPLIFIERS



AILTECH
DIVISION CUTLER-HAMMER
CONTROL

WARNING!

When operating, hazardous voltages are present in this unit.

AILTECH RF Power Sources, when connected to radiating devices, are capable of generating high intensity electric fields. High level fields may be harmful to humans. Reasonable precaution should be taken to avoid prolonged exposure to high strength fields.

AILTECH makes NO specific recommendations as to "human susceptibility" but advises users to investigate and determine power limits and conditions for safety of personnel.

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PREFACE

The general operation of AILTECH's expanding line of linear power amplifiers, with their specifications and performance verification, is described in this manual.

AILTECH solid-state linear amplifiers are designed to be driven by signal sources such as milliwatt sweepers and frequency synthesizers.

AILTECH linear amplifiers feature a true directional wattmeter to measure forward and reflected power delivered to the load. Additionally, an output sample dc voltage from the directional coupler, proportional to the forward power, is made available to the front panel for external leveling. Leveling the amplifier's output increases the flatness typically by a factor of two, and improves the effective output impedance. In order to accomplish the above operation, it is necessary to use a source with external leveling capability and a negative input voltage requirement.

TABLE 1. SPECIFICATIONS

	1020	2020	5020
Power Output	10 watts minimum 20 watts available over most of the band	20 watts minimum 35 watts available over most of the band	50 watts minimum 75 watts available over most of the band
Compression	Less than 1 dB at 10 watts output	Less than 1 dB at 20 watts output	Less than 1 dB at 40 watts output
Frequency Response	1-200 MHz Usable 500KHz to 225MHz	1-200 MHz Usable 500KHz to 225MHz	1-200 MHz Usable 500KHz to 225MHz
Gain	40 dB Minimum	43 dB Minimum	47 dB Minimum
Gain Variation	±1.5 dB(at all power levels up to 10 watts)	±1.5 dB (at all power levels up to 20 watts)	±1.5 dB (at all power levels up to 50 watts)
Total Harmonic Distortion	All harmonics more than 25 dB down.	All harmonics more than 25 dB down.	All harmonics more than 25 dB down.
Third Order Intermodulation Distortion	Typically more than 25 dB down from 1-200 MHz	Typically more than 25 dB down from 1-200 MHz	Typically more than 25 dB down from 1-200 MHz
Input VSWR	1.5:1 Typical	1.5:1 Typical	1.5:1 Typical
Load Impedance	Will deliver rated performance into load VSWRs as high as 1.5:1	Will deliver rated performance into load VSWRs as high as 1.5:1	Will deliver rated performance into load VSWRs as high 1.5:1
Noise Figure	9dB Maximum	9dB Maximum	9dB Maximum
Protection	Unit will withstand 10dB overdrive with output load VSWR of 1.5:1. Will not be damaged operating at full rated power into any load.	Unit will withstand 10dB overdrive with output load VSWR of 1.5:1. Will not be damaged operating at full rated power into any load.	Unit will withstand 10dB overdrive with output load VSWR of 1.5:1. Will not be damaged operating at full rated power into any load.
Output Metering	True directional wattmeter for both forward and reflected power. A dc sample voltage proportional to forward power, nominally -1 volt at 10 watts output for external leveling. (See Diagram)	True directional wattmeter for both forward and reflected power. A dc sample voltage proportional to forward power, nominally -1 volt at 20 watts output for external leveling. (See Diagram)	True directional wattmeter for both forward and reflected power. A dc sample voltage proportional to forward power, nominally -1 volt at 50 watts output for external leveling. (See Diagram)
Power Requirements	115/230 volts ± 10% 50/60Hz, 125 watts nominal.	115/230 volts ± 10% 50/60Hz, 350 watts nominal.	115/230 volts ± 10% 50/60Hz, 500 watts nominal
Size:	7" x 8½"x 17" (17.8x21.6x43.2cm)	17½" x 17" x 7" (43.8x43.2x17.8cm)	17½" x 17" x 7" (43.8x43.2x17.8cm)
Weight:	22 lbs. (10KG)	43 lbs. (19.5KG)	45 lbs. (20.3KG)

SPECIFICATIONS

	20512	35512
Power Output	20 watts minimum 30 watts available over most of the band	35 watts minimum 50 watts available over most of the band
Compression	less than 1 dB at 10 watts output	less than 1 dB at 15 watts output
Frequency Response	150-512 MHz	150-512 MHz
Gain	43 dB Nominal (1 mw input for full rated output)	43 dB Nominal (1mw input for full rated output)
Gain Variation	± 2dB (at all power levels up to rated)	± 2dB (at all power levels up to rated)
Total Harmonic Distortion	All harmonics more than 25dB down	All harmonics more than 25dB down
Third Order Intermodulation Distortion	Typically more than 25dB down	Typically more than 25dB down
Third Order Intercept	+50 dBm (Typical)	+50 dBm (Typical)
Input VSWR	2:1 Typical	2:1 Typical
Load Impedance	Will deliver rated performance into load VSWRs as high as 1.5:1	Will deliver rated performance into load VSWRs as high as 1.5:1
Noise Figure	12dB typical	12dB typical
Protection	Unit will withstand 10DB overdrive with output load VSWR of 1.5:1. Will not be damaged operating at full rated power into any load	Unit will withstand 10DB overdrive with output load VSWR of 1.5:1. Will not be damaged operating at full rated power into any load
Output Metering	True directional watt- meter for both forward and reflected power. A D.C. sample voltage proportional to forward power, nominally -1 Volt at 20 Watts out- put for external leveling	True directional watt- meter for both forward and reflected power. A D.C. sample voltage proportional to forward power, nominally -1 Volt at 20 Watts out- put for external leveling
Power Requirements	115/230 volts ±10% 50/60Hz 400 watts	115/230 volts ±10% 50/60Hz 500 watts
Size	17¼" x 17" x 7" (43.8x43.2x17.8cm)	17¼" x 17" x 7" 43.8x43.2x17.8cm)
Weight	43 lbs (19.5KG)	43 lbs (19.5KG)

SPECIFICATIONS

	5001	15100 (Tentative)
Power Output	50 watts minimum 75 watts available over most of the band	15 watts minimum 25 watts available over most of the band
Compression	Less than 1 dB at 40 watts output	--------
Frequency Response	10KHz-10MHz	500-1000MHz
Gain	37 dB minimum (10 mW input for rated output)	42 dB minimum (1 mW input for full rated output)
Gain Variation	±1.5 dB (at all power levels up to 30 watts)	±3 dB (at all power levels up to rated)
Total Harmonic Distortion	All harmonics more than 25 dB down @40W	All harmonics more than 25 dB down
Third Order Intermodulation Distortion	Typically more than 25 dB down	Typically more than 25 dB down
Third Order Intercept	+57 dBm (Typical)	+47 dBm (Typical)
Input VSWR	-------	3:1 Typical
Load Impedance	Will deliver rated performance into load VSWRs as high as 1.5:1.	Will deliver rated performance into load VSWRs as high as 1.5:1.
Noise Figure	--------	12 dB typical
Protection	Unit will withstand 10 dB overdrive with output load VSWR of 1.5:1. Will not be damaged operating at full rated power into any load.	Unit will withstand 10 dB overdrive with output load VSWR of 1.5:1. Will not be damaged operating at full rated power into any load.
Output Metering	True directional watt- meter for both forward and reflected power. A D.C.sample voltage proportional to forward power, nominally -1 volt at 50 watts output for external leveling.	True directional watt- meter for both forward and reflected power. A D.C. sample voltage proportional to forward power, nominally -1 volts at 10 watts output for external leveling.
Power Requirements	115/230 volts ±10% 50/60 Hz 500 watts nominal	115/230 volts ±10% 50/60 Hz 500 watts nominal
Size	7" x 8-1/2" x 17" (17.8 x 21.6 x 43.2cm)	17-1/4" x 17" x 7" (43.8 x 43.2 x 17.8cm)
Weight	43 lb. (19.5 kg)	43 lb. (19.5 kg)

PERFORMANCE VERIFICATION

Performance of AILTECH linear amplifiers may be verified by using a power meter rated over the frequency range, a high-power attenuator, and a 100-dB step attenuator with .1-dB steps.

Connect the amplifier, attenuators, and power meter as shown in Figure 1.

a. Set the attenuator initially to 10 dB.

b. Increase power at the frequency source to the rated power of the amplifier.

c. Manually tune the frequency source over the amplifier's frequency range.

d. The step attenuator should not have to be varied more than the flatness specification to maintain a constant output power.

NOTE: This test assumes the output of the sweeper is constant over the measurement range. If it is not, add the sweeper's uncertainty to the above flatness specification.

To test for the 1-dB compression point, connect the amplifier as shown in Figure 1.

a. With the attenuator set in the 20-dB position, adjust the source to drive the amplifier to an output level at 10 dB below the 1-dB compression point.

b. Reduce the attenuation until the power increases to the 1-dB compression point.

c. The attenuation should not have to be decreased by more than 11 dB in this test.

To check the harmonic level, use a frequency source with harmonics and spurious signals 10 dB below the rated specification for the amplifier. Connect amplifier as shown in Figure 2.

CAUTION

Do not measure harmonics with amplifier operating above rated power. Check power level where measurement is made. (See Table 1 for specification.)

The internal directional flatness may be checked by connecting the amplifier as shown in Figure 3.

Adjust the source for an output of 3 dB below the rated power level for the amplifier. Without changing the level, vary the frequency over the bandwidth of the amplifier. The output power should not vary more than the rated specification, under leveled conditions. (See Table 1.)

If a sweeper with leveling is not available, it is still possible to check if the coupler voltage is present at the ALC connector. Operate the amplifier as shown in Figure 1. With the output set to full power, measure the ALC voltage with the adjustment potentiometer fully cw. The voltage should be greater than rated specification. (See Table 1.)

GENERAL OPERATION

Connect the AILTECH linear amplifier to a suitable source of line power. NOTE: Use only AILTECH supplied power cords when operating AILTECH equipment. The RF input is a signal within the frequency range of the amplifier, and an output level of 1 milliwatt or less. Connect as shown in Figure 4. If leveled operation is desired, connect ALC as shown in Figure 3.

CAUTION

AILTECH linear amplifiers are designed to withstand an overdrive of 10 dB above the input power level required for rated output power with an output load VSWR of 1.5:1 or less. For load VSWR's greater than 1.5:1, limit drive to an input power level required for full rated output into a 1:1 load VSWR. If the above conditions are met, AILTECH linear amplifiers will be stable and protected under any load VSWR. When operating any amplifier, especially into a high VSWR load, if increasing the input power does not increase the output power appreciatively, DO NOT OPERATE ABOVE THAT OUTPUT LEVEL UNDER ANY CONDITION.

REPAIR OF AILTECH LINEAR AMPLIFIERS

Included in this manual are simplified block schematics and interconnect wiring diagrams for the linear amplifiers. If difficulties arise in the linear amplifier's operation, the faulty module can be located quickly. In the event of a power supply failure, standard troubleshooting procedures may be applied, or the linear amplifier should be returned to AILTECH for repair.

If the trouble is traced to the amplifier module assembly, the repair is beyond the scope of this manual. It is strongly recommended that the local factory representative be contacted for repair information.

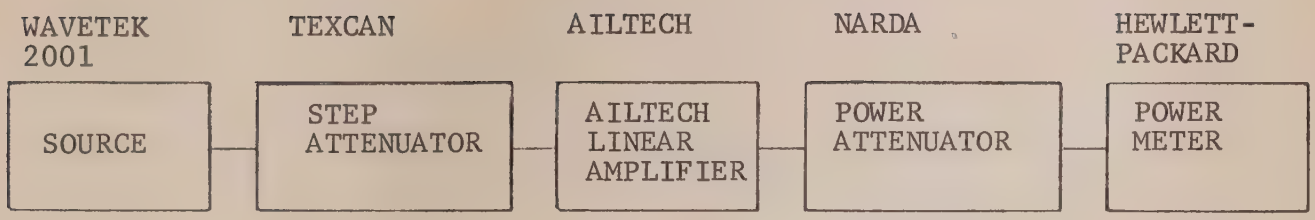


FIGURE 1

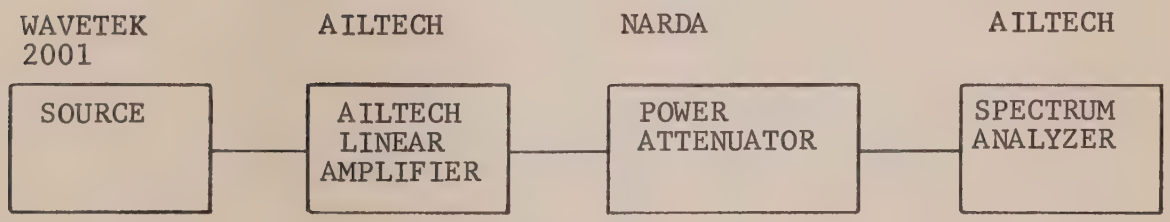


FIGURE 2

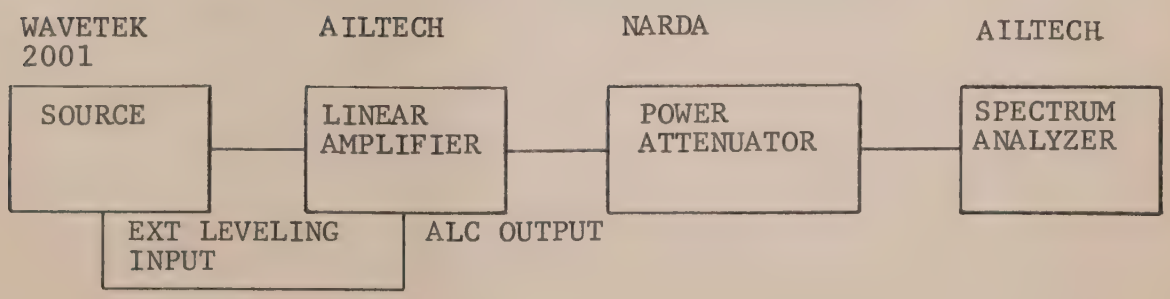


FIGURE 3

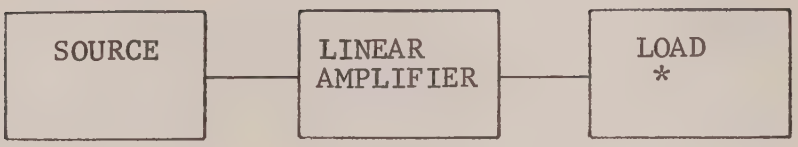


FIGURE 4

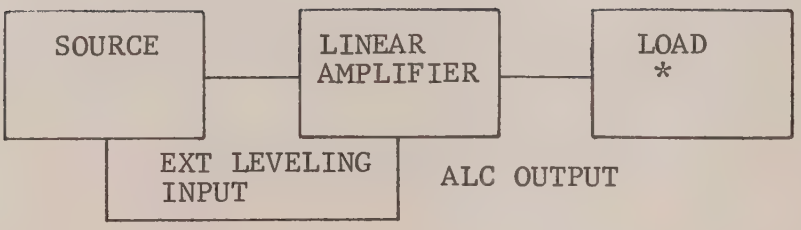


FIGURE 5

* See general operating instructions concerning overdrive with high Load VSWR.

VENDOR CODES

Code No.	Name and Address
04713	Motorola, Inc., Semiconductor Products Div., Phoenix, AZ
05245	Corcom Inc., Chicago, IL
05571	Sprague Electric Co., Pacific Div., Los Angeles, CA
09353	C & K Components, Inc., Watertown, MA
12678	AILTECH, a Cutler-Hammer Co., City of Industry, CA
14099	Semtech Corp., Newbury Park, CA
23936	Pamotor Div., Wm. J. Purdy Co., Burlingame, CA
28905	Elexon, Inc., Santa Ana, CA
50522	Monsanto Commercial Products Co., Electronics Special Products, Cupertino, CA
50579	Litronix, Inc., Cupertino, CA
51106	Standard Power, Inc., Santa Ana, CA
73138	Beckman Instruments, Helipot Div., Fullerton, CA
75915	Littelfuse, Inc., Des Plaines, IL

ELECTRICAL PARTS LIST, MODEL 1020

Symbol	Figure	Description	Part No.	Vendor
B101	6	Fan	4600	23936
F101	-	Fuse, Slo-Blo, 2A	313002	75915
J101	-	Recep., Power Line	6J4	05245
J405	6	Jack, Bulkhead	UG1094/U	Com'l
LED401	6	LED, Red	MV5054-3	50522
M401	6	Meter, 100 μa	B856-5427	12678
PS101	6	Power Supply	OLV60-28	28905
R401	8	Res.,2.7k,1/2W,5%	RC20GF272J	Com'l
R402	8	Potentiometer,10k	72P-R(10k)	73138
R403	8	Res.,27k,1/4W,5%	RC20GF273J	Com'l
R404	8	Potentiometer,10k	72P-R(10k)	73138
R405	8	Potentiometer,10k	72P-R(10k)	73138
R406	8	Res.,10k,1/4W,5%	RC07GF103J	Com'l
R407	8	Res.,10k,1/4W,5%	RC07GF103J	Com'l
S401	6	Switch	7101J62ZQ-2-2	09353
S402	6	Switch	7101J51CQ-2-2	09353
S403	6	Switch	7101J51CQ-2-2	09353
	6	Amplifier Module Assembly	D852-1109	12678
J402 P202	-	Cable Assembly	B852-0938-1	12678
J404 P204	-	Cable Assembly	B852-0938-2	12678

ELECTRICAL PARTS LIST, MODEL 2020

Symbol	Figure	Description	Part No.	Vendor
B101	7	Fan	4600	23936
B201	-	Fan	4600	23936
C401	8	Cap.,0.01μF	CK05BX103K	Com'l
C402	8	Cap.,0.01μF	CK05BX103K	Com'l
C403	8	Cap.,50μF,50V	39D506G050EE4	05571
C404	8	Cap.,50μF,50V	39D506G050EE4	05571
CR401	8	Diode	S2M	14099
CR402	8	Diode	S2M	14099
F101	-	Fuse, Slo-Blo, 5A	3AG-313-005	75915
IC401	8	Integrated Circuit	MC1741CL	04713
J101	-	Receptacle,Power Line	6J4	05245
J402	7	Jack, Bulkhead	UG1094/U	Com'l
LED401	7	LED, Red	RL5054-2	50579
M401	7	Meter	B856-5435	12678
PS101	7	Power Supply	SPS220-24-M1901	51106
R401	8	Res.,2.7k,1W,5%	RC32GF272J	Com'l
R402	8	Pot., 10k	72P-R(10K)	73138
R403	8	Res., Test Select	Selected	Com'l
R404	8	Pot., 10k	72P-R(10K)	73138
R405	8	Pot., 10k	72P-R(10K)	73138
R406	8	Res.,10k,1/4W,5%	RC07GF103J	Com'l
R407	8	Res., Test Select	Selected	Com'l
R408	8	Res.,10k,1/4W,5%	RC07GF103J	Com'l
R409	8	Res.,10k,1/4W,5%	RC07GF103J	Com'l
R410	8	Res.,750Ω,1W,5%	RC32GF751J	Com'l
R411	8	Res.,470Ω,1/4W,5%	RC07GF471J	Com'l
R412	8	Res.,470Ω,1/4W,5%	RC07GF471J	Com'l
R413	8	Res.,750Ω,1W,5%	RC32GF751J	Com'l
S401	7	Switch	7101J62ZQ22	09353
S402	7	Switch	7101J51CQ22	09353
S403	7	Switch	7101J51CQ22	09353
VR401	8	Diode, Zener	1N5242B	Com'l
VR402	8	Diode, Zener	1N5242B	Com'l
P201 & J401		Cable Assembly	B852-1089	12678
P202 & P301		Cable Assembly	B852-1090	12678
P302 & J403		Cable Assembly	B852-1091	12678
	7	Amplifier Module Assy.	B852-1131-1	12678
	7	Coupler Assembly	B852-1136	12678

ELECTRICAL PARTS LIST, MODEL 5020

Symbol	Figure	Description	Part No.	Vendor
B101	7	Fan	4600	23936
B201	-	Fan	7600S	23936
C401	8	Cap.,0.01μF	CK05BX103J	Com'l
C402	8	Cap.,0.01μF	CK05BX103J	Com'l
C403	8	Cap.,50μF,50V	39D506G050EE4	05571
C404	8	Cap.,50μF,50V	39D506G050EE4	05571
CR401	7	Diode	S2M	14099
CR402	7	Diode	S2M	14099
F101	-	Fuse, Slo-Blo, 8A	3AG-313-008	75915
IC401	8	Integrated Circuit	MC1741CL	04713
J101	-	Receptacle,Power Line	6J4	05245
J402	7	Jack, Bulkhead	UG1094/U	Com'l
LED401	7	LED, Red	RL5054-2	50579
M401	7	Meter	B856-5436	12678
PS101	7	Power Supply	SPS220-24-M1901	51106
R401	8	Res.,2.7k,1W,5%	RC32GF272J	Com'l
R402	8	Pot., 10k	72P-R(10K)	73138
R403	8	Res., Test Select	Selected	Com'l
R404	8	Pot., 10k	72P-R(10K)	73138
R405	8	Pot., 10k	72P-R(10K)	73138
R406	8	Res.,10k,1/4W,5%	RC07GF103J	Com'l
R407	8	Res., Test Select	Selected	Com'l
R408	8	Res.,10k,1/4W,5%	RC07GF103J	Com'l
R409	8	Res.,10k,1/4W,5%	RC07GF103J	Com'l
R410	8	Res.,750Ω,1W,5%	RC32GF751J	Com'l
R411	8	Res.,470Ω,1/4W,5%	RC07GF471J	Com'l
R412	8	Res.,470Ω,1/4W,5%	RC07GF471J	Com'l
R413	8	Res.,750Ω,1W,5%	RC32GF751J	Com'l
S401	7	Switch	7101J62ZQ22	09353
S402	7	Switch	7101J51CQ22	09353
S403	7	Switch	7101J51CQ22	09353
VR401	8	Diode, Zener	1N5242B	Com'l
VR402	8	Diode, Zener	1N5242B	Com'l
P201 & J401		Cable Assembly	B852-1089	12678
P202 & P301		Cable Assembly	B852-1090	12678
P302 & J403		Cable Assembly	B852-1091	12678
	7	Amplifier Module Assy.	B852-1131-2	12678
	7	Coupler Assembly	B852-1136	12678

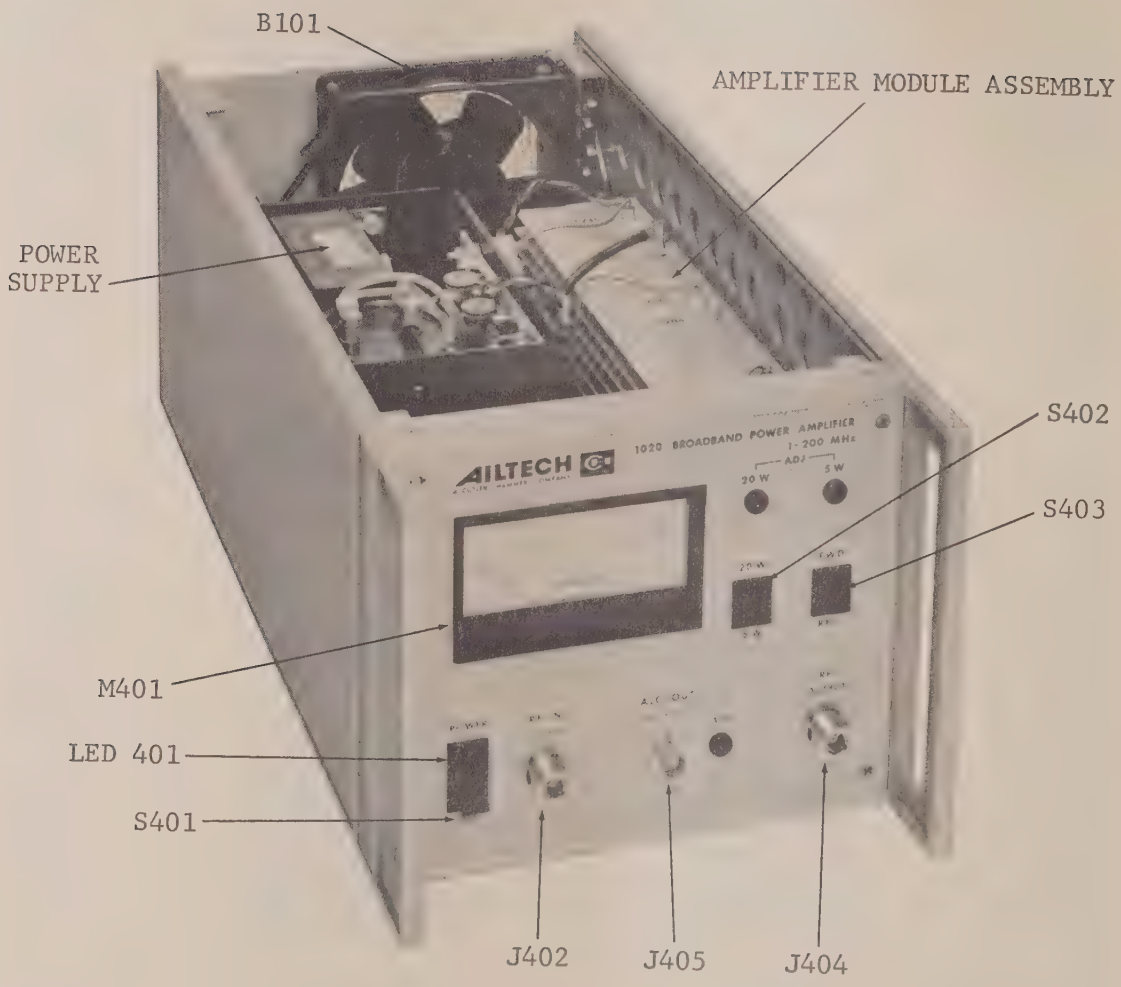


FIGURE 6. COMPONENT IDENTIFICATION, 1020

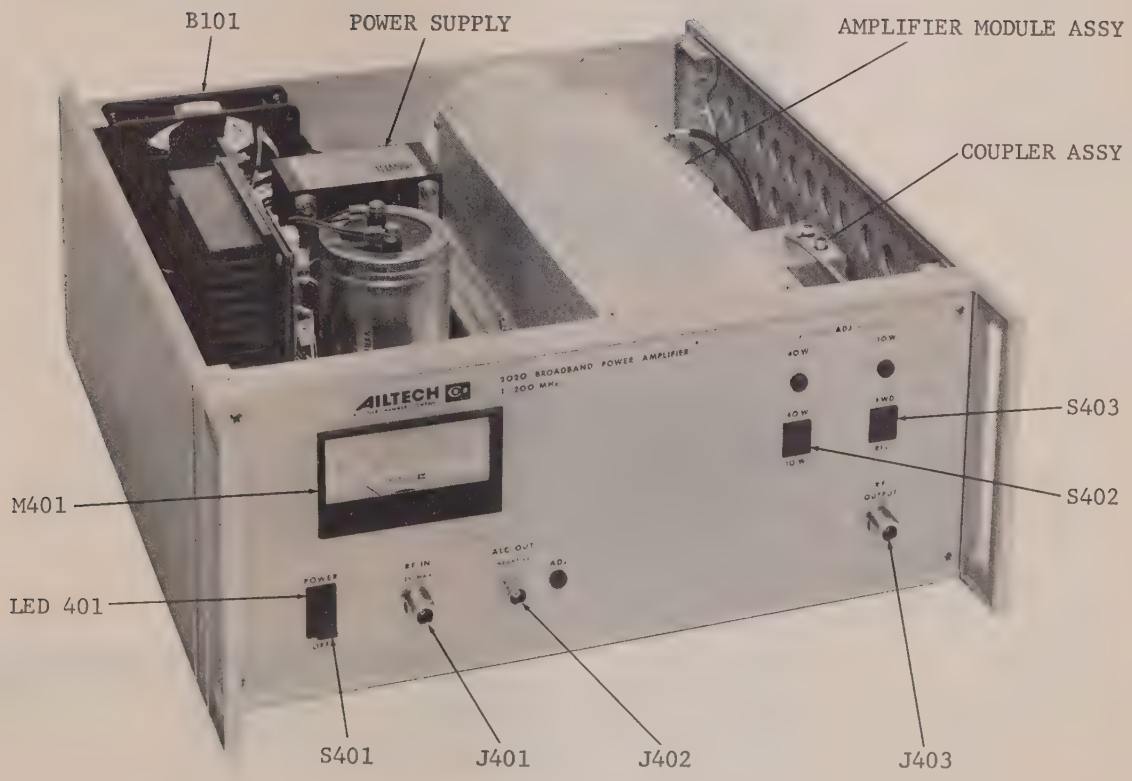


FIGURE 7. COMPONENT IDENTIFICATION, 2020/5020

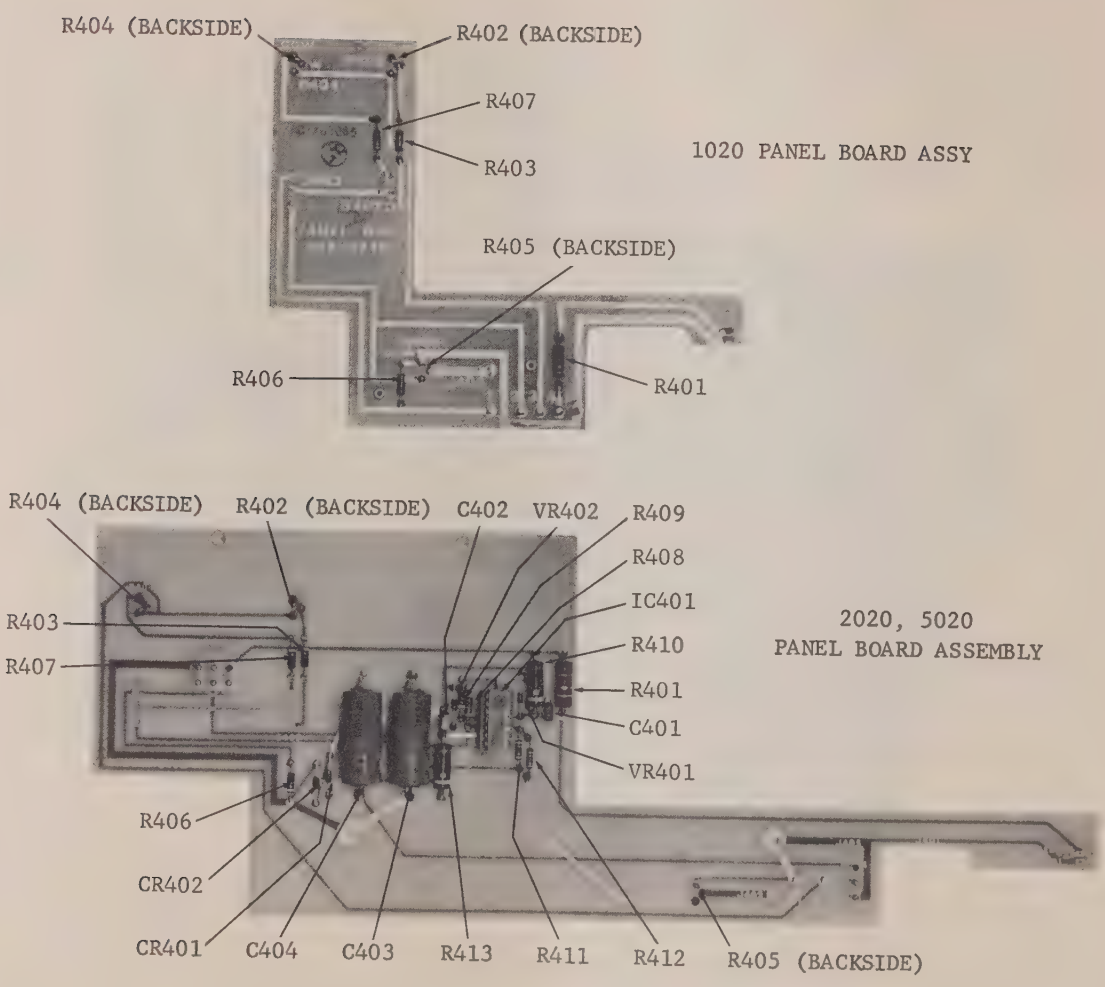
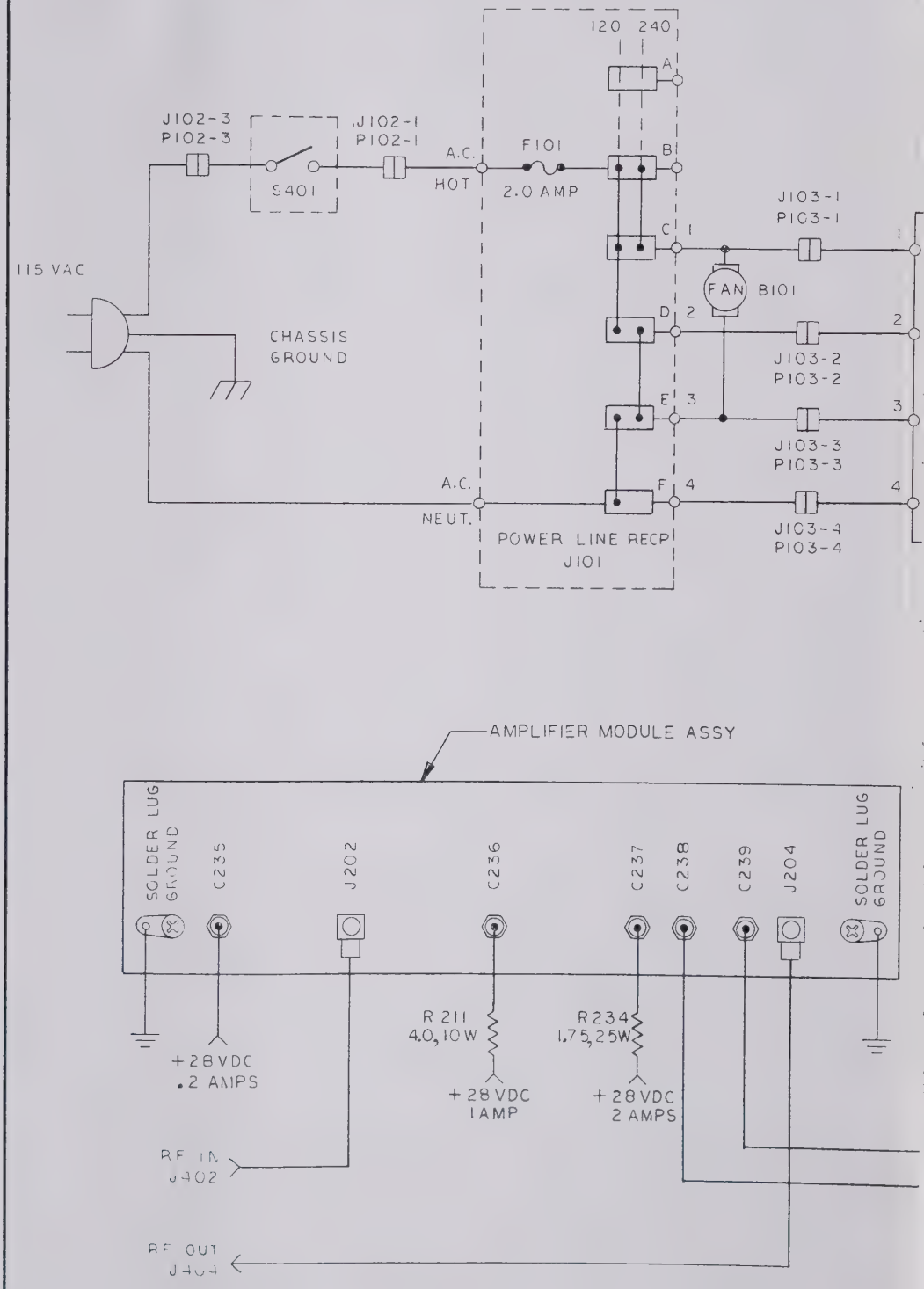


FIGURE 8. PANEL BOARD ASSEMBLIES

APPENDIX

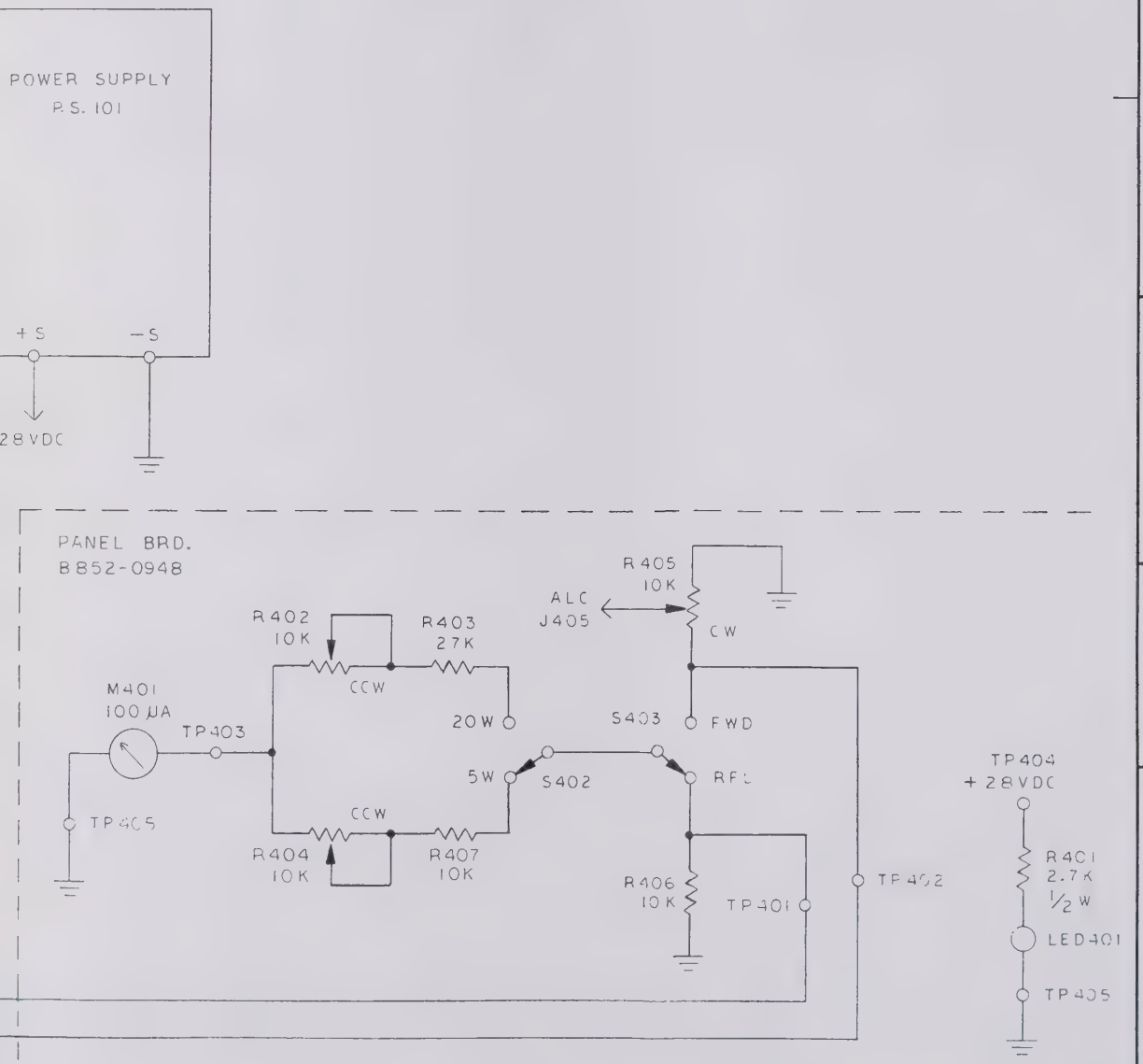
Title	Drawing Number
Schematic, 1020 Amplifier	C852-1177
Schematic, 2020 Amplifier	D852-1087
Schematic, 5020 Amplifier	D852-1052
Wiring and Cabling Hookup, 1020	C852-0998
Wiring and Cabling Hookup, 2020/5020	D852-1137
Schematic, Metering Circuit, 2020/5020	B852-1156
Interconnect Drawing, 2020/5020	C852-1157
Interconnect Drawing, 5001	C852-1339
Interconnect Drawing, 20512	C852-1222
Wiring and Hookup, 5001	C852-1335
Wiring and Hookup, 20512/35512	D852-1220



1. BREAK ALL SHARP EDGES
NOTES: UNLESS OTHERWISE SPECIFIED

BISHOP GRAPHICS/ACCUPRESS
REORDER NO A 9238

LET	ECO	REVISION DESCRIPTION	BY	DATE	APP



ITEM	QTY.	DESCRIPTION	SYMBOL	PART NO.
USED ON	QTY.	UNLESS OTHERWISE NOTED		
1020	REF	CONCENTRICITY ____ T.I.R.		
		SURFACE FINISH: ____ MICRO INCHES		
		DEC. .XXX ± ____ .XX ± ____		
		FRAC. ± ____		
		ANG. ± ____		
		HOLE DIA. ____		
		COMMER. TOL. APPLY TO STOCK DIMENSIONS THREADS TO MIL-S-7742		

AILTECH
A CUTLER HAMMER COMPANY
CONTROL

TITLE: SCHEMATIC, 1020

MATERIAL: ____ APP: ____ APP: ____

CHECKED BY: ____

DRAWN BY: R. WIEN

SURFACE TREATMENT: ____

SCALE: ____ WT.: ____ DATE: 4-21-7?

DRAWING NUMBER: C852-1177 REV: ____

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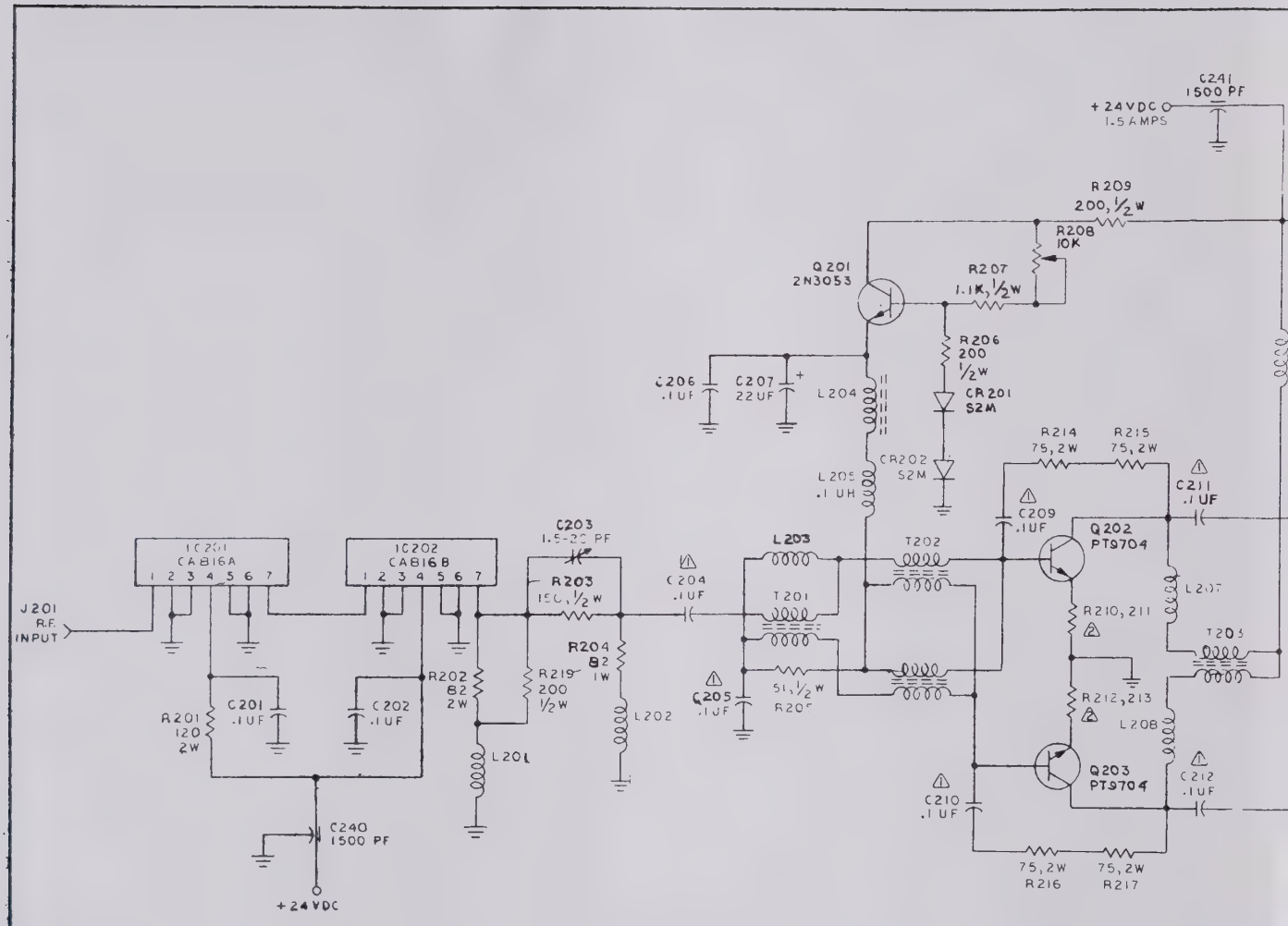
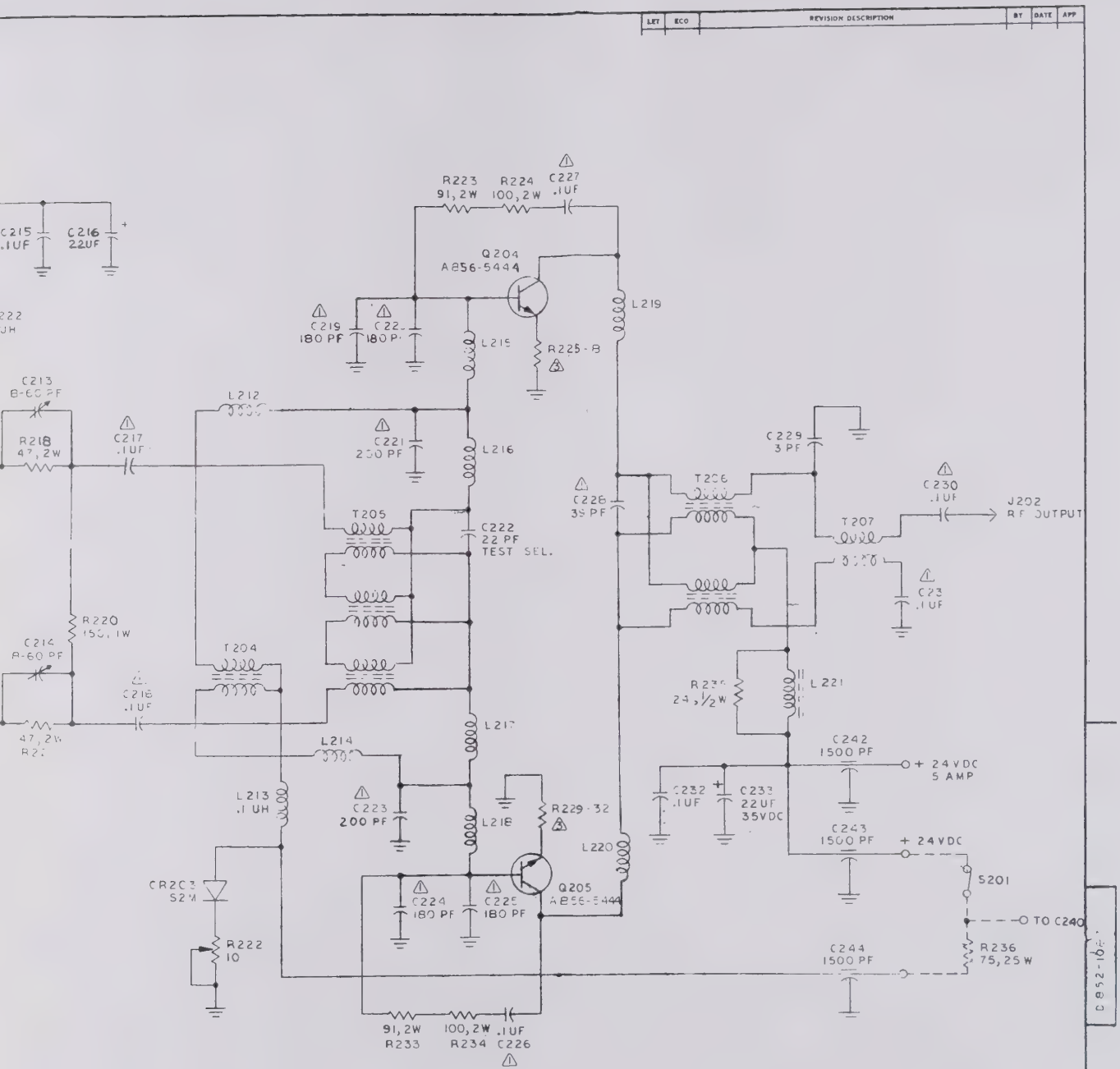


2 SILICON RESISTOR 0.75Ω, DRWG. NO. A 856-5434.

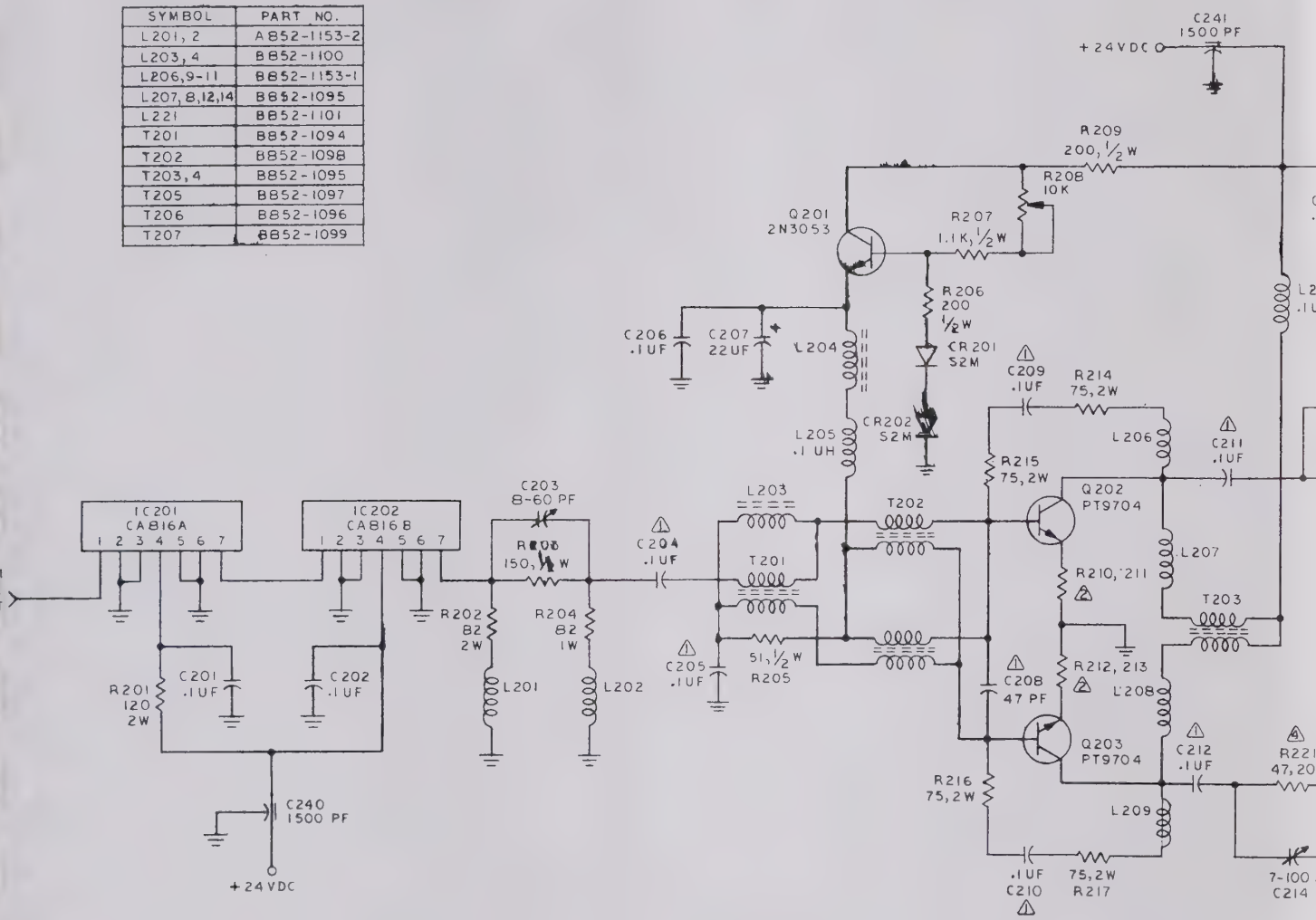
1 SILICON RESISTOR 3.0Ω, DRWG. NO. A 856-5433.

△ CHIP CAPACITOR

NOTES: UNLESS OTHERWISE NOTED

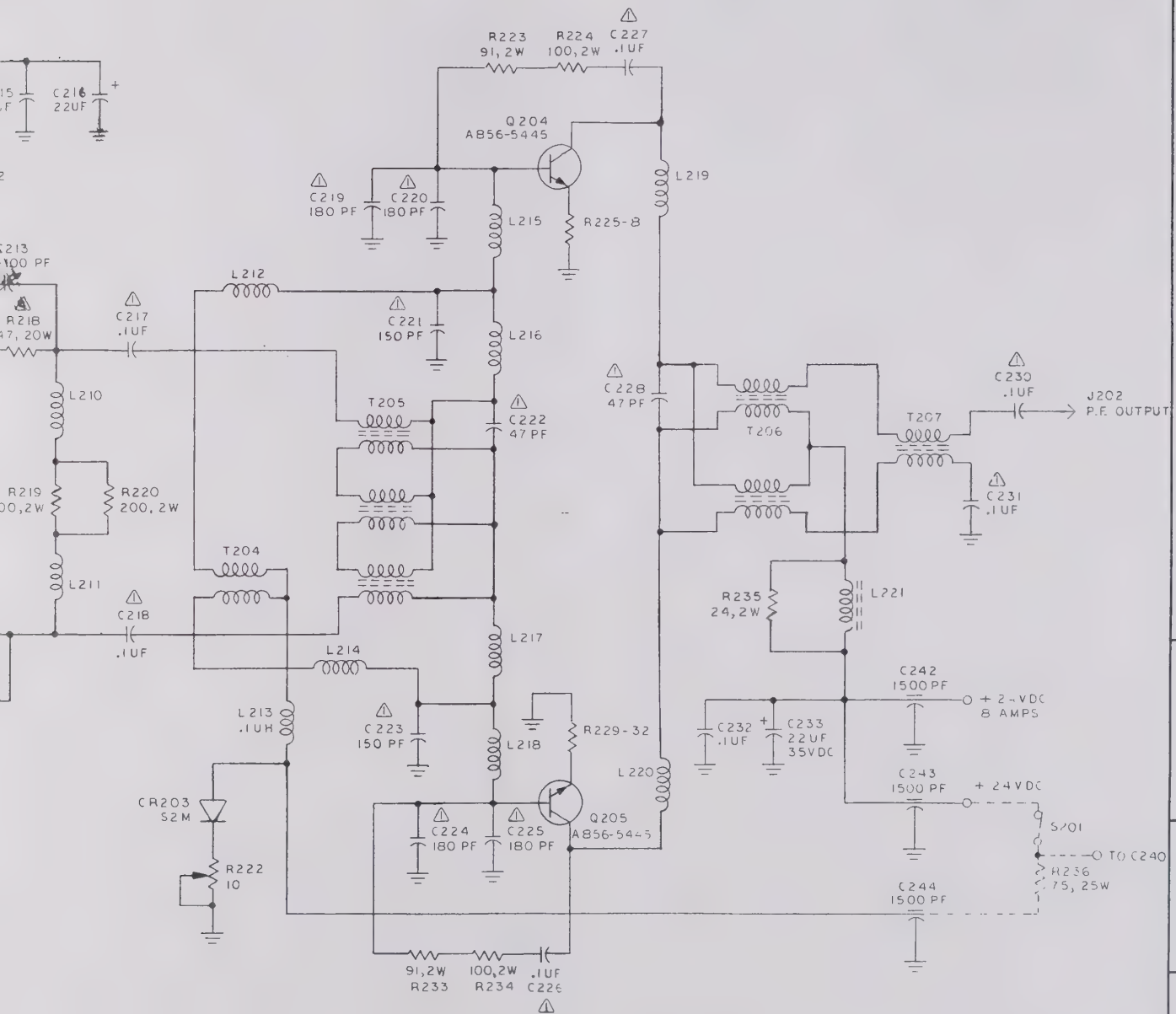

REVISION DESCRIPTION
R223 91, 2W
R224 100, 2W
C227 .1UF
Q204 A856-5444
L219
C219 180 PF
C22- 180 PF
L215
R225-B
C215 .1UF
C216 22UF
C213 8-60 PF
R218 47, 2W
C217 .1UF
L212
C221 250 PF
L216
C229 3 PF
C228 39 PF
T206
C230 .1UF
J202 RF OUTPUT
T207
T205
C222 22 PF TEST SEL.
C23 .1UF
R220 150, 1W
C214 8-60 PF
T204
C218 .1UF
R23- 24, 1/2W
L221
C242 1500 PF
+ 24 VDC 5 AMP
L217
47, 2W R2-
L214
C232 .1UF
C233 22UF 35VDC
L213 .1 UH
C223 200 PF
L218
R229-32
L220
+ 24VDC
CR203 S2M
Q205 A856-5444
S201
C224 180 PF
C225 180 PF
TO C240
R222 10
C243 1500 PF
R236 75, 25 W
C244 1500 PF
91, 2W R233
100, 2W .1UF R234 C226
D852-1087
ITEM QTY
DESCRIPTION
SYMBOL
PART NO.
USED ON
QTY.
2020
1
UNLESS OTHERWISE NOTED
CONCENTRICITY
TIR
SURFACE FINISH
MICRO INCHES
DEC.
FRAC
ANG
HOLE DIA
COMMER. TOL. APPLY TO STOCK DIMENSIONS THREADS TO MIL STD
AILTECH
TITLE
2020 AMPLIFIER
MATERIAL
SURFACE TREATMENT
APP
CHECKED BY
DRAWN BY
SCALE
WT
DATE
DRAWING NUMBER
D852-1087
REV

SYMBOL	PART NO.
L201, 2	A852-1153-2
L203, 4	B852-1100
L206, 9-11	B852-1153-1
L207, 8, 12, 14	B852-1095
L221	B852-1101
T201	B852-1094
T202	B852-1098
T203, 4	B852-1095
T205	B852-1097
T206	B852-1096
T207	B852-1099



⚠ CHIP RESISTOR, PROFILM CORP. MODEL NO. PMS-200 (STUD MOUNTED).
⚠ SILICON RESISTOR 0.5 Ω, DRWG. NO. A 856-5434.
⚠ SILICON RESISTOR 1.0Ω, DRWG. NO. A 856-5433.
⚠ CHIP CAPACITOR
OTES: UNLESS OTHERWISE NOTED

LET	ECO	REVISION DESCRIPTION	BY	DATE	APP
A	8416	PER ECO	RW	11/3/80	RL
B	8892	PER ECO	DW	11/3/80	RL



ITEM	QTY.	DESCRIPTION	SYMBOL	PART NO.
USED ON	QTY.	UNLESS OTHERWISE NOTED		
5020	1	CONCENTRICITY T.I.R.		
		SURFACE FINISH MICRO INCHES		
		DEC .XXX ± .XX ±		
		FRAC. ± ANG ±		
		HOLE DIA		
		COMMER TOL APPLY TO STOCK DIMENSIONS THREADS TO MIL-S-7742		

AILTECH
A CUTLER HAMMER COMPANY

TITLE [illegible] AMP. P.E.

MATERIAL

SURFACE TREATMENT

APP APP

CHECKED BY

DRAWN BY

SCALE WT. DATE

DRAWING NUMBER REV

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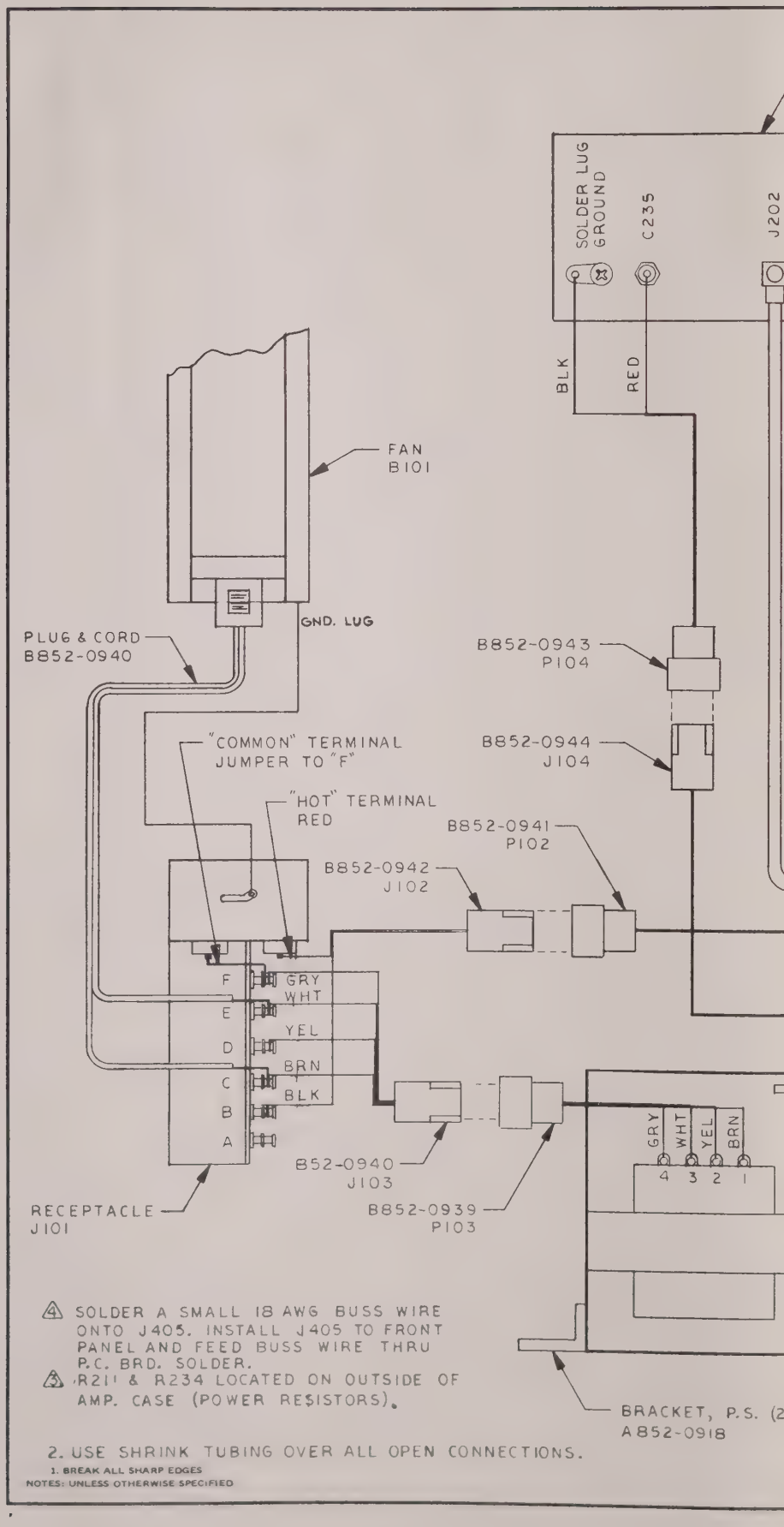
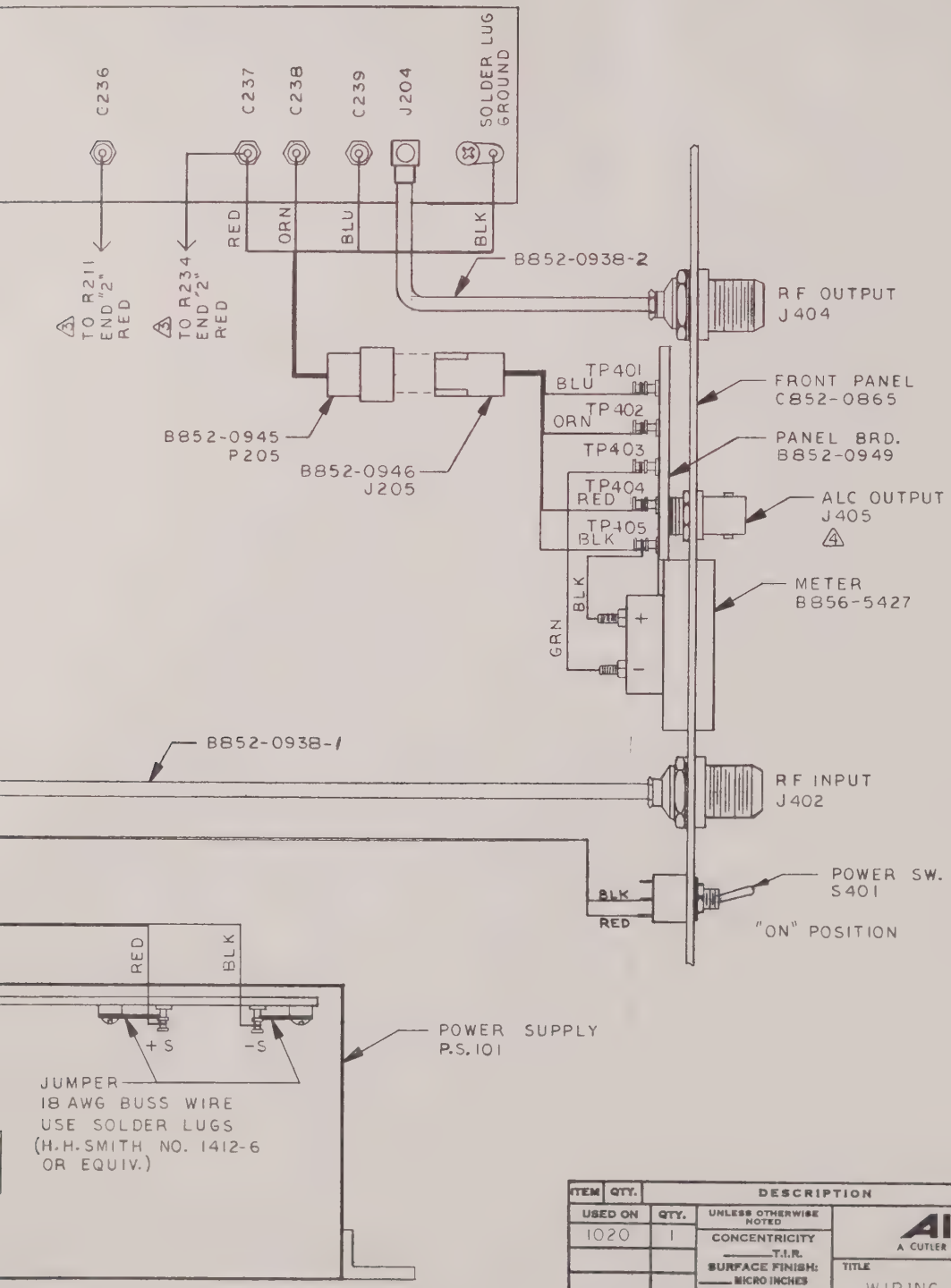
D852-1052 B


SOLDER LUG GROUND
C235
J202
BLK
RED
FAN B101
GND. LUG
PLUG & CORD B852-0940
B852-0943 P104
B852-0944 J104
"COMMON" TERMINAL JUMPER TO "F"
"HOT" TERMINAL RED
B852-0941 P102
B852-0942 J102
F
E
D
C
B
A
GRY WHT
YEL
BRN
BLK
B52-0940 J103
B852-0939 P103
RECEPTACLE J101
GRY
WHT
YEL
BRN
4 3 2 1
BRACKET, P.S. (2
A852-0918
4 SOLDER A SMALL 18 AWG BUSS WIRE ONTO J405. INSTALL J405 TO FRONT PANEL AND FEED BUSS WIRE THRU P.C. BRD. SOLDER.
3 R211 & R234 LOCATED ON OUTSIDE OF AMP. CASE (POWER RESISTORS).
2. USE SHRINK TUBING OVER ALL OPEN CONNECTIONS.
1. BREAK ALL SHARP EDGES
NOTES: UNLESS OTHERWISE SPECIFIED

LET	ECO	REVISION DESCRIPTION	BY	DATE	APP
A	7674	PER ECO	C.B.	3/12	DH

CASE, AMPLIFIER
C852-0916



C852-0998 A

ITEM	QTY.	DESCRIPTION	SYMBOL	PART NO.
USED ON	QTY.			
1020	1			

UNLESS OTHERWISE NOTED
CONCENTRICITY ——— T.I.R.
SURFACE FINISH: ——— MICRO INCHES
DEC: .XXX ± ——— .XX ± ———
FRAC. ± ———
ANG. ± ———
HOLE DIA. ———
COMMER. TOL. APPLY TO STOCK DIMENSIONS & THREADS TO MIL-S-7742

AILTECH
A CUTLER HAMMER COMPANY

TITLE: WIRING & CABLING HOOKUP

MATERIAL ———
SURFACE TREATMENT ———

APP ——— APP ———
CHECKED BY ———
DRAWN BY E. VAN
SCALE ——— WT. ——— DATE 3-11-75

DRAWING NUMBER C852-0998 REV A

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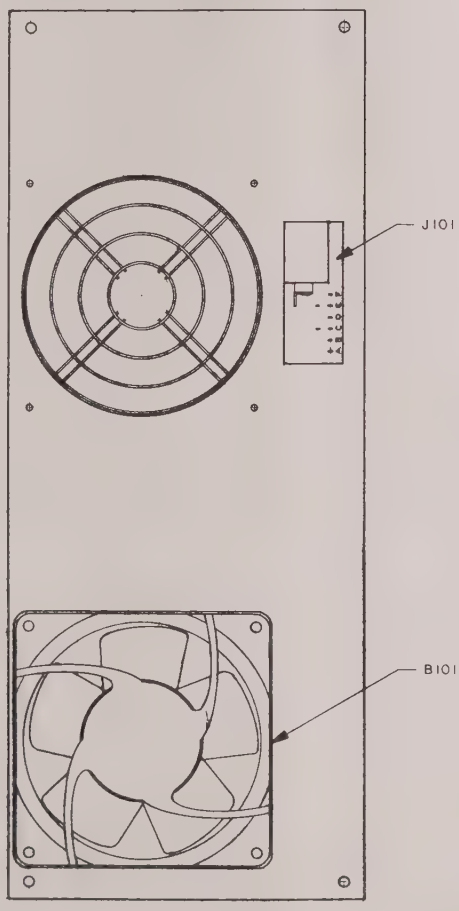
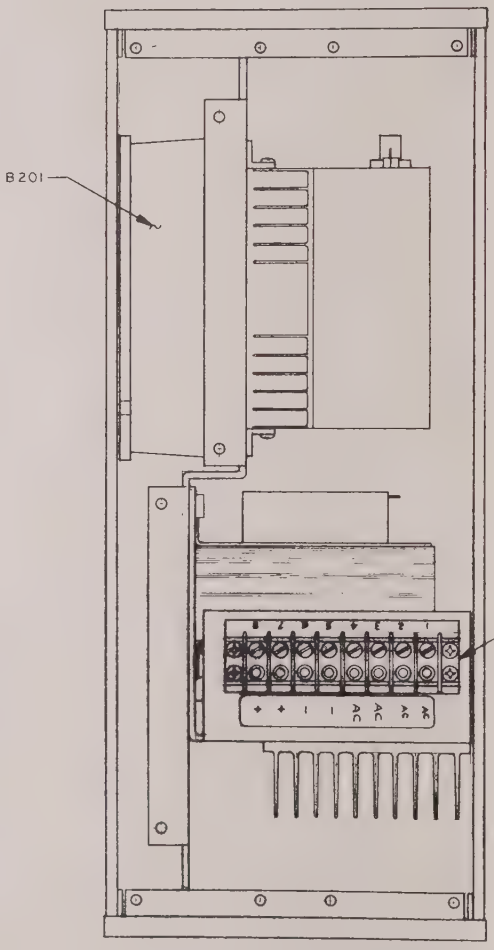
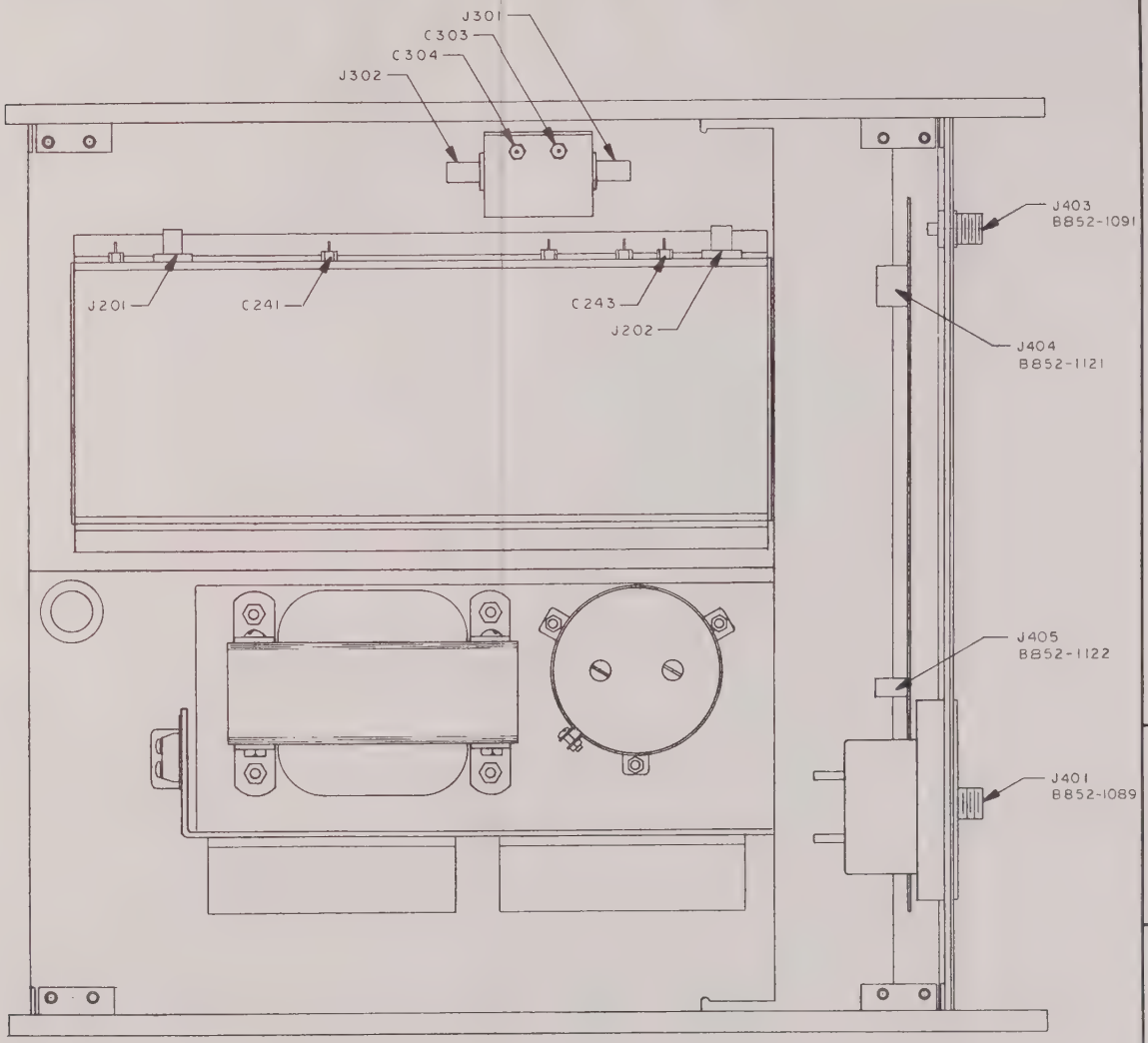




PART NO.	WIRE NO.
B852-1121	110
B852-1121	111
B852-1121	113
B852-1121	114
———	115
———	118
———	121
———	105
———	106
———	107
———	108
———	109
———	———
———	———
———	———
———	———
B852-1091	———
B852-1090	———
B852-1090	———
B852-1089	———
B852-1123&4	———
B852-1122	120

NOTE:
1. MODEL 5020 SHOWN.

LET	ECO	REVISION DESCRIPTION	BY	DATE	APP



- TB101

COLOR	FROM	TO	
RED	J404-2	C303	2 CONDUCTOR SHIELDED
BLK	J404-3	C304	
BLK	J404-5	TB101 (NEG.)	
RED	J404-6	TB101 (POS.)	
RED	C241	TB101 (POS.)	
RED	C243	TB101 (POS.)	
GRN	GND LUG(AMP)	TB101 (NEG.)	
BRN	J101-"C"	TB101-AC(1)	TWISTED PAIR
ORN	J101-"D"	TB101-AC(2)	TWISTED PAIR
YEL	J101-"E"	TB101-AC(3)	
BLU	J101-"F"	TB101-AC(4)	
GRN	J101-GND LUG	TB101 (NEG.)	
K (1)	B101	TB101-AC(1)	
K (2)	B101	TB101-AC(3)	
K (1)	B201	TB101-AC(1)	
K (2)	B201	TB101-AC(3)	
OAX.	P301	J301	
OAX	P302	J302	
OAX.	P202	J202	
OAX.	P201	J201	
—	P102	J102	
RED	J405-1	P.S.101 ?	

	ITEM	QTY.	DESCRIPTION	SYMBOL	PART NO.
	4	ONE	CABLE ASSY., P202 & P302		B852-[illegible]
	3	ONE	HARNESS, J404	J404	B852-1[illegible]
-2	5020	2	ONE FINAL ASSEMBLY, 5020		D852-1 [illegible]
-1	2020	1	ONE FINAL ASSEMBLY, 2020		D852-1 32

USED ON	QTY.
2020	1
5020	1

UNLESS OTHERWISE NOTED
CONCENTRICITY ——— T.I.R.
SURFACE FINISH: ——— MICRO INCHES
DEC. .XXX ± ——— .XX ± ———
FRAC. ± ———
ANG. ± ———
HOLE DIA. ———
COMMER. TOL. APPLY TO STOCK DIMENSIONS THREADS TO MIL S 7742

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AILTECH
A CUTLER HAMMER COMPANY

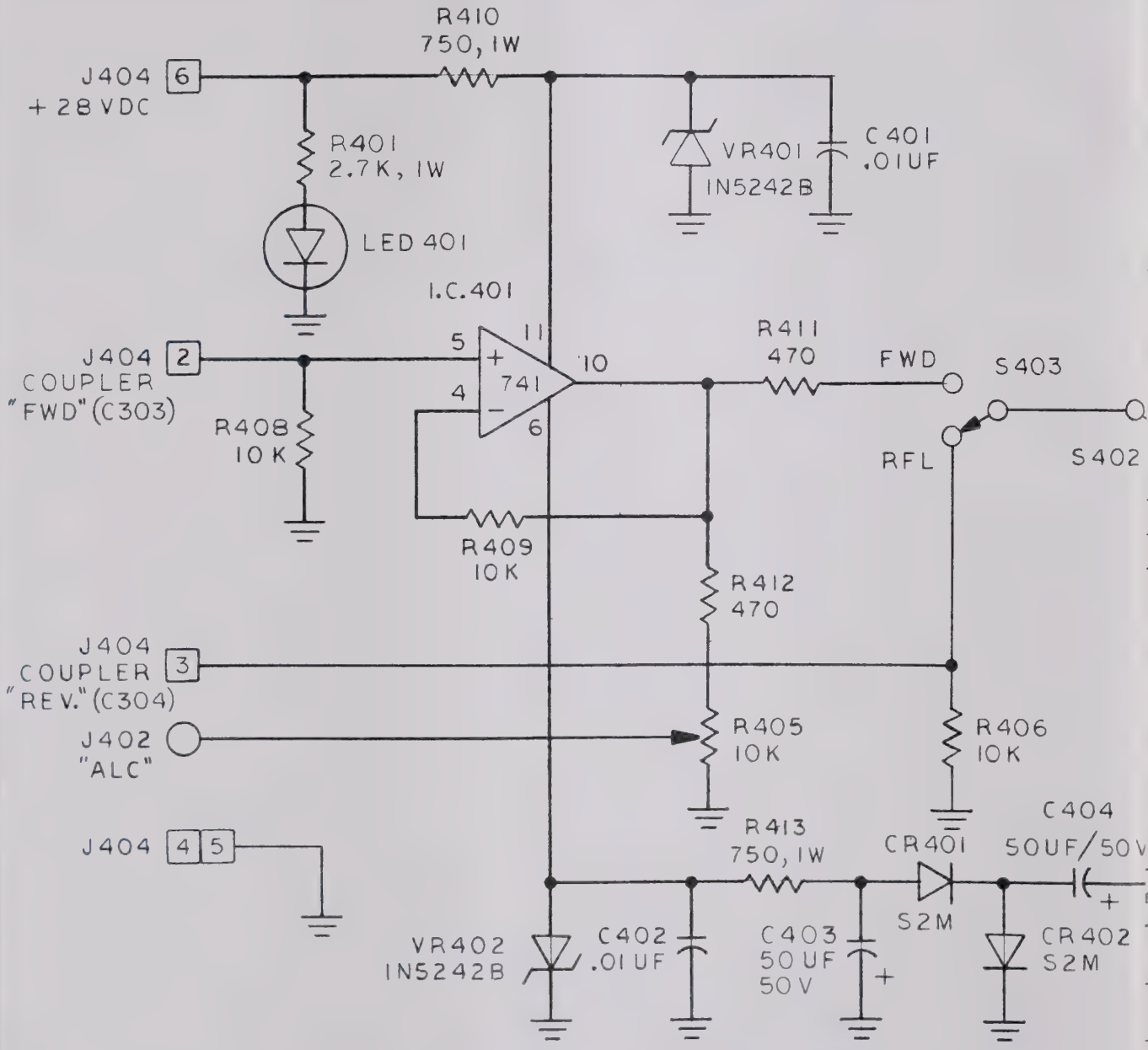
TITLE: WIRING & CABLE HOOKUP

MATERIAL | SURFACE TREATMENT

APP | CHECKED BY | DRAWN BY | SCALE | WT. | DATE

DRAWING NUMBER: D852-13[illegible] | REV

D852-1137

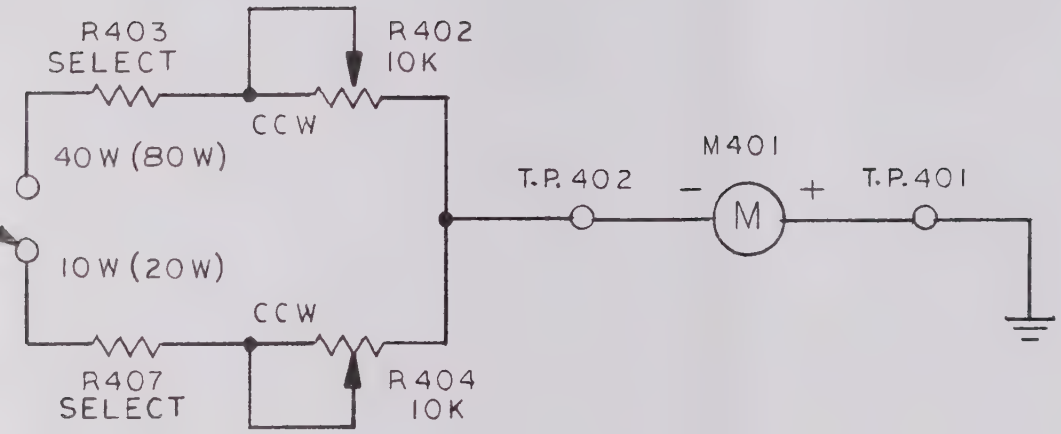


1. ALL RESISTORS ARE 1/4 W, 5%.

NOTES: UNLESS OTHERWISE SPECIFIED

B852-1156

LET	ECO	REVISION DESCRIPTION	BY	DATE	APP



1 J405
20V PEAK

ITEM	QTY.	DESCRIPTION	SYMBOL	PART NO.

USED ON	QTY.
2020	1
5020	1

UNLESS OTHERWISE NOTED
CONCENTRICITY ——— T.I.R.
SURFACE FINISH: ——— MICRO INCHES
DEC. .XXX ±——— .XX ±———
FRAC. ±———
ANG. ±———
HOLE DIA. ———
COMMER. TOL. APPLY TO STOCK DIMENSIONS THREADS TO MIL-S-7742

AILTECH
A CUTLER · HAMMER COMPANY

TITLE SCHEMATIC
METERING CIRCUIT

MATERIAL ———
SURFACE TREATMENT ———

APP ——— APP ———
CHECKED BY ———
DRAWN BY R. WIEN
SCALE ——— WT. ——— DATE 3-16-77

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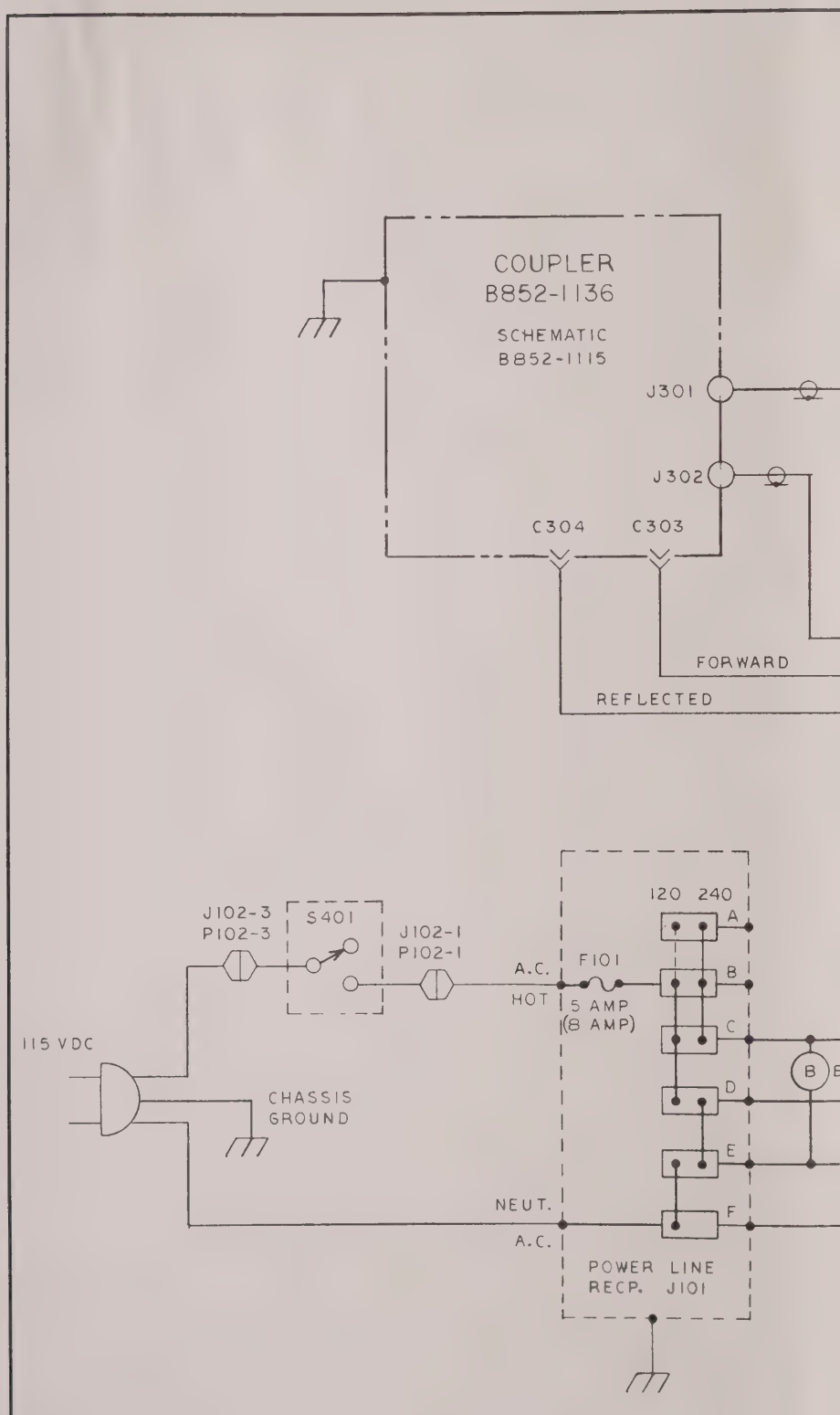
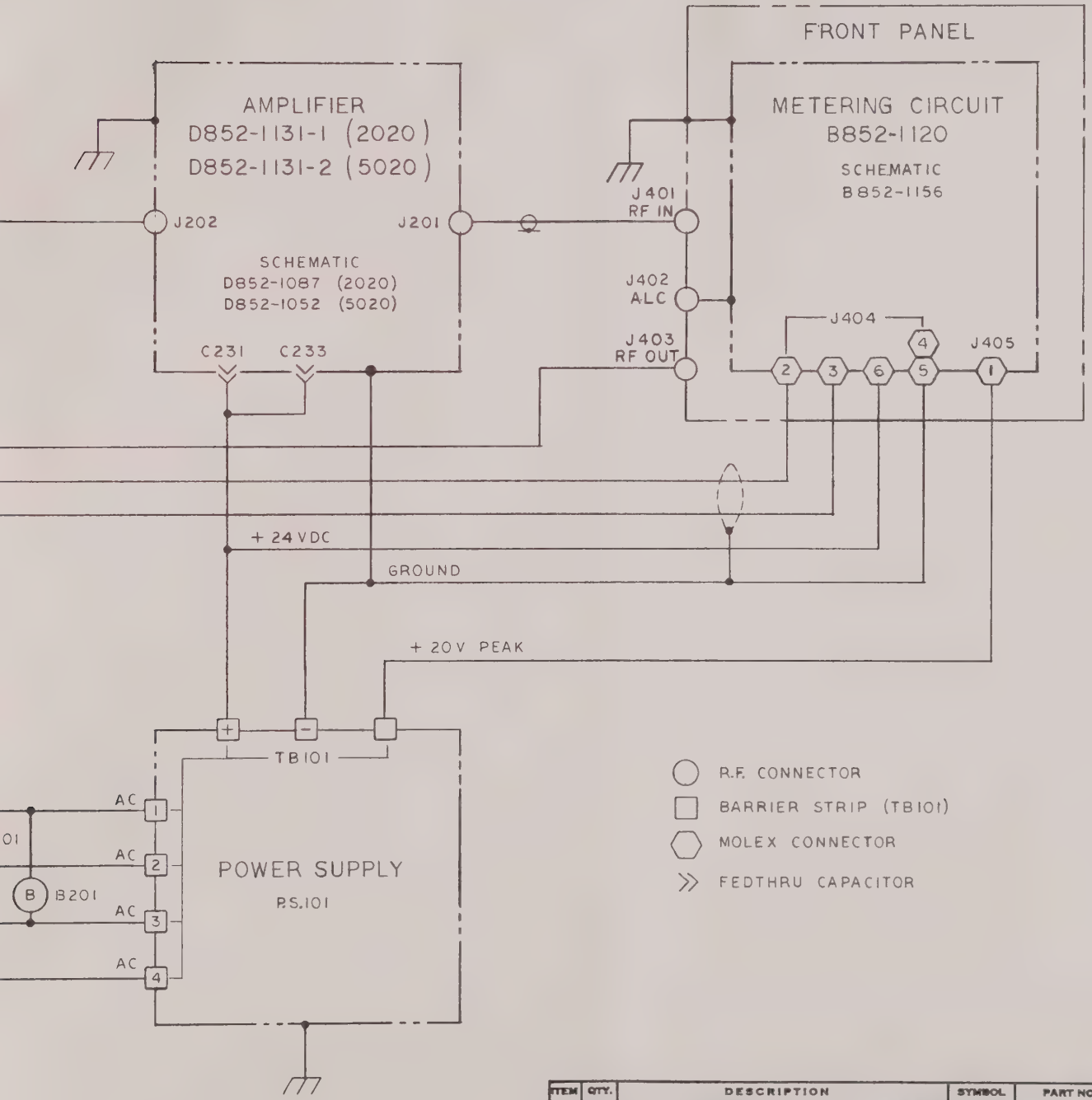
DRAWING NUMBER B852-1156
REV



1. BREAK ALL SHARP EDGES
NOTES: UNLESS OTHERWISE SPECIFIED

LET	ECO	REVISION DESCRIPTION	BY	DATE	APP



ITEM	QTY.	DESCRIPTION	SYMBOL	PART NO.

USED ON	QTY.
2020	
5020	

UNLESS OTHERWISE NOTED
CONCENTRICITY ——— T.I.R.
SURFACE FINISH: ——— MICRO INCHES
DEC. .XXX ± ——— .XX ± ———
FRAC. ± ———
ANG. ± ———
HOLE DIA. ———
COMMER. TOL. APPLY TO STOCK DIMENSIONS THREADS TO MIL-S-7742

AILTECH
A CUTLER · HAMMER COMPANY

TITLE: INTERCONNECT DRWG.

MATERIAL ———
SURFACE TREATMENT ———

APP [illegible] APP [illegible]
CHECKED BY [illegible]
DRAWN BY R. WIEN
SCALE ——— WT. ——— DATE 3-16-77

DRAWING NUMBER C852-1157
REV

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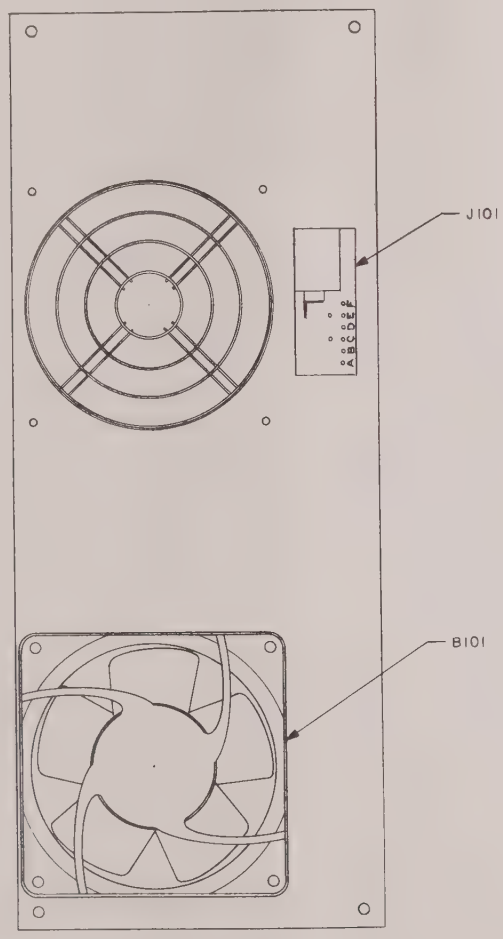
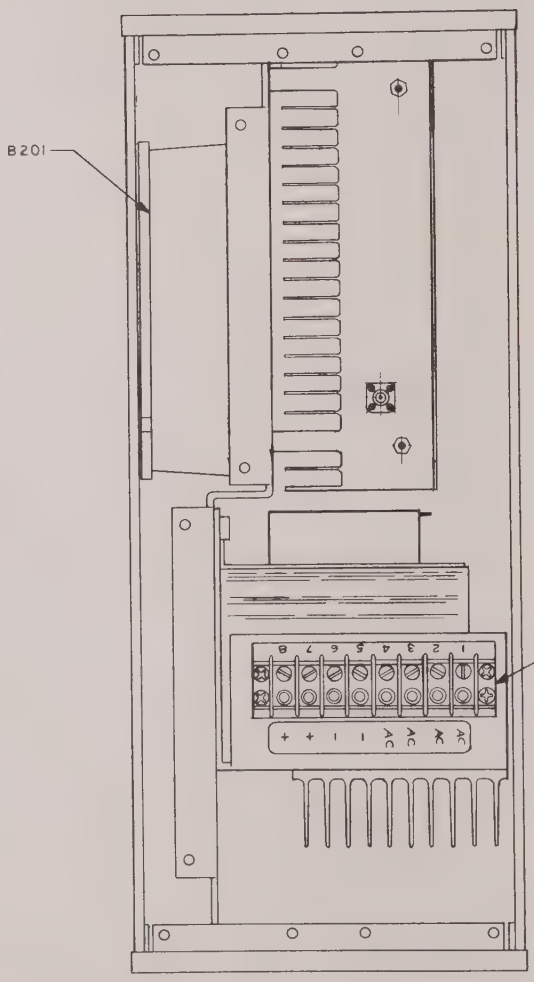
C852-1157





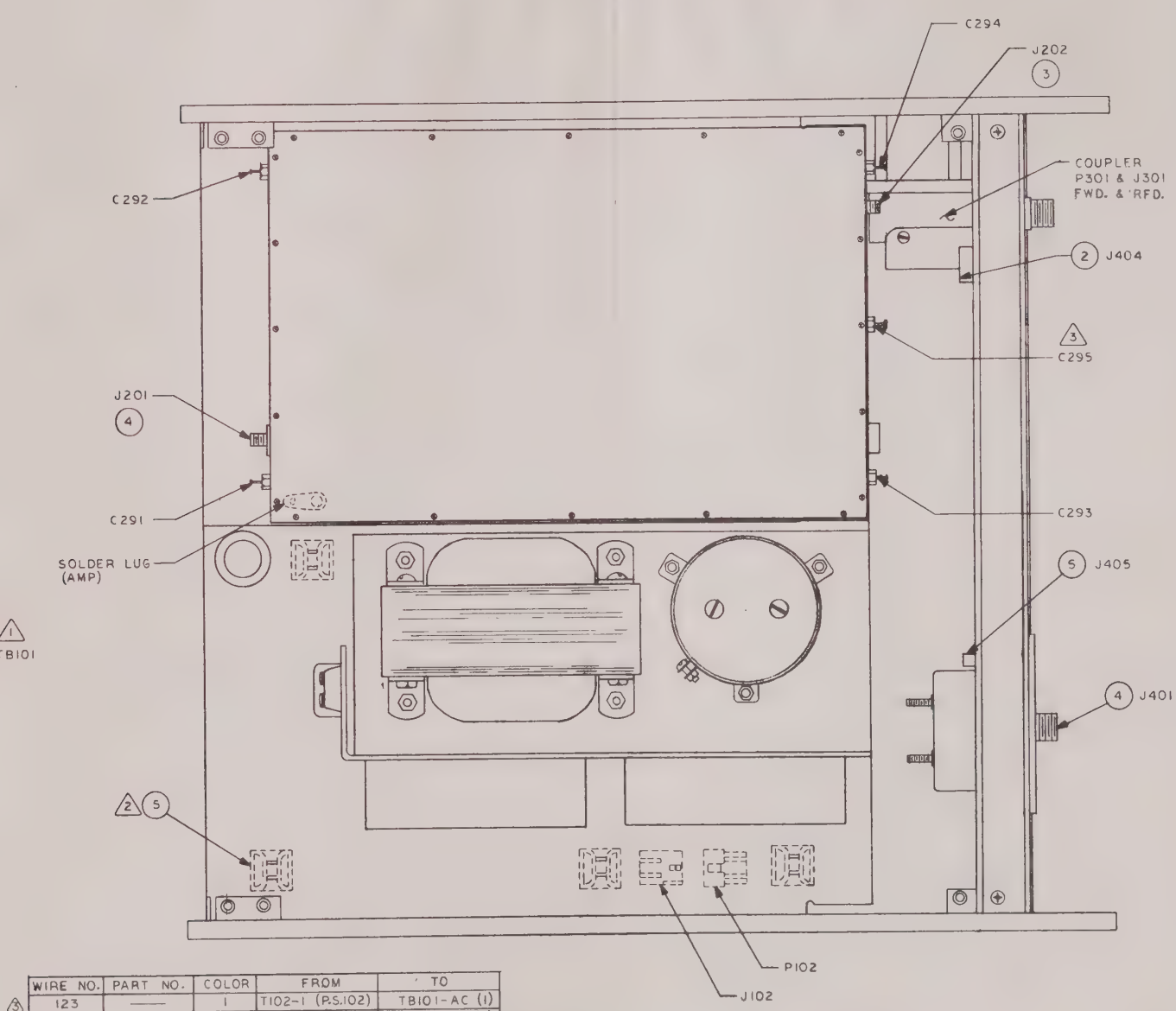
TWISTED PAIR
TWISTED PAIR
2 CONDUCTOR SHIELDED

WIRE NO.	PART NO.	COLOR	FROM	TO
105	——	1	J101-"C"	TB101-AC(1)
106	——	3	J101-"E"	TB101-AC(2)
107	——	4	J101-"D"	TB101-AC(3)
108	——	6	J101-"F"	TB101-AC(4)
109	——	5	J101-GND LUG	TB101-NEG.
110	B852-1121	2	J404-2	COUPLER-FWD.
111	B852-1121	0	J404-3	COUPLER-RFL.
113	B852-1121	0	J404-5	TB101-NEG.
114	B852-1121	2	J404-6	TB101-POS.
115	——	2	C291	TB101-POS.
116	——	2	C292	TB101-POS.
117	——	2	C293	TB101-POS.
118	——	2	C294	TB101-POS.
119	——	5	GND LUG(AMP)	TB101-NEG.
120	——	2	J405-1	P.S 101-CR2 (ANODE LEAD)
——	B852 210	COAx.	P201	J201
——	B852-1213	COAx.	P202	J202
——	B852-1213	COAx.	P301 (COUPLER)	J301 (COUPLER)
——	——	BLK (1)	B101	TB101-AC(1)
——	——	BLK(2)	B101	TB101-AC(2)
——	——	BLK(3)	B201	TB101-AC(3)
——	——	BLK(2)	B201	TB101-AC(4)

NOTES:

1. REMOVE ALL STRAPS ON TB101 BEFORE MAKING ANY CONNECTIONS.
2. ATTACH APPROX. AS SHOWN, FAR SIDE 4 PLCS.
3. USED ON 35512 ONLY.

LET	ECO	REVISION DESCRIPTION	BY	DATE	APP
A	8200	PER ECO	R.W.	9/15/77	DH



WIRE NO.	PART NO.	COLOR	FROM	TO
123	——	1	T102-1 (P.S.102)	TB101-AC (1)
124	——	3	T102-3 (P.S.102)	TB101-AC (2)
125	——	4	T102-2 (P.S.102)	TB101-AC (3)
126	——	6	T102-4 (P.S.102)	TB101-AC (4)
127	——	5	P.S.102--V	TB101-NEG.
128	——	7	P.S.102-+V	C295

ITEM	QTY.	DESCRIPTION	SYMBOL	PART NO.
5	ONE	HARNESS, J405		B852-1122
4	ONE	CABLE ASSY., P201 & J401		B852-1210
3	ONE	CABLE ASSY., P202 & P302		B852 1090
2	ONE	HARNESS, J404	J404	B852-1121
1	ONE	FINAL ASSEMBLY		D852-1221

USED ON	QTY.
20512	1
35512	1

UNLESS OTHERWISE NOTED
CONCENTRICITY ——— T.I.R.
SURFACE FINISH: ——— MICRO INCHES
DEC. .XXX ± ——— .XX ± ———
FRAC. ± ———
ANG. ± ———
HOLE DIA. ———
COMMER. TOL. APPLY TO STOCK DIMENSIONS THREADS TO MIL S 7742

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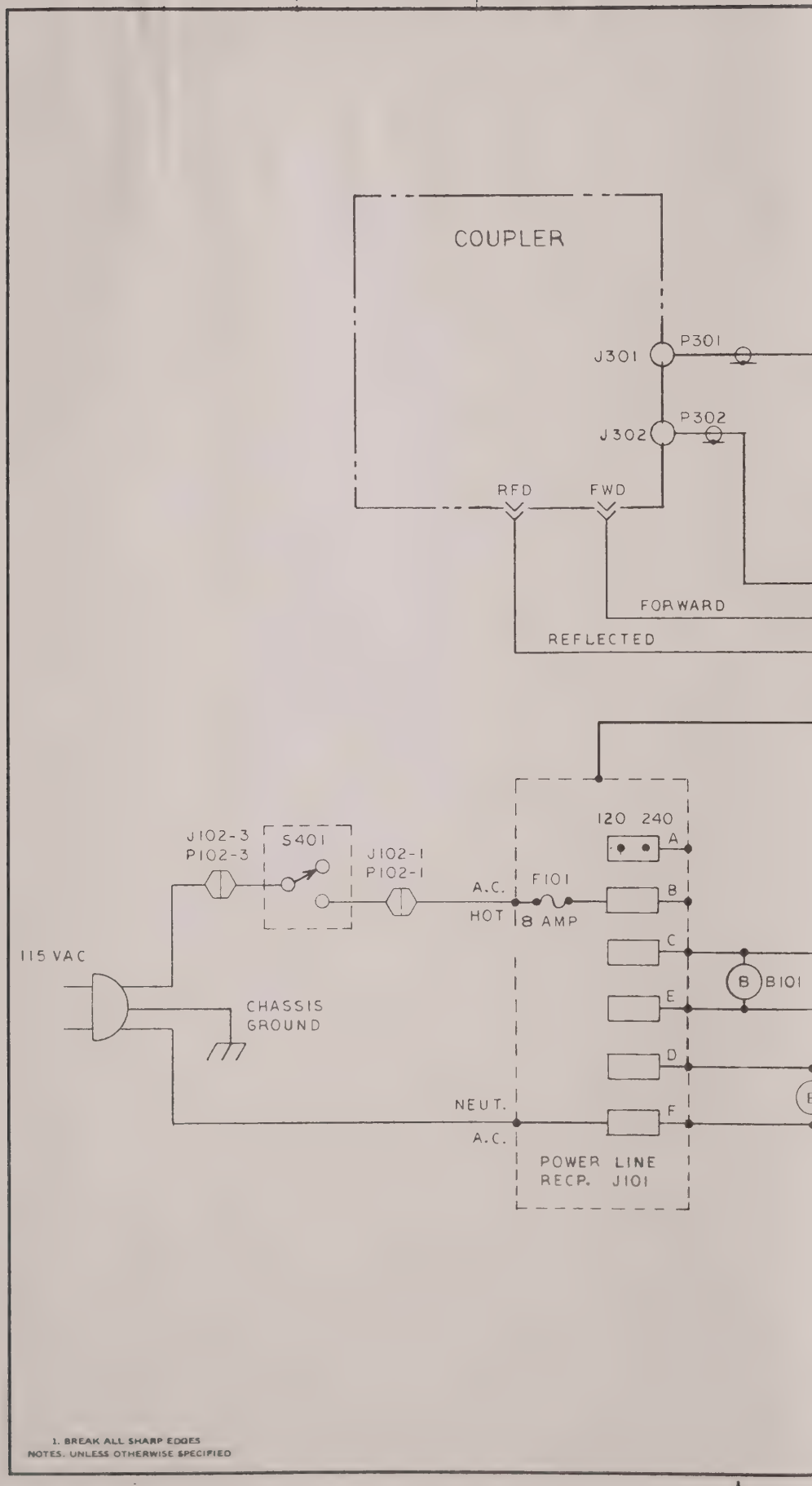
AILTECH
A CUTLER HAMMER COMPANY

TITLE: WIRING & HOOKUP

MATERIAL: ———
SURFACE TREATMENT: ———

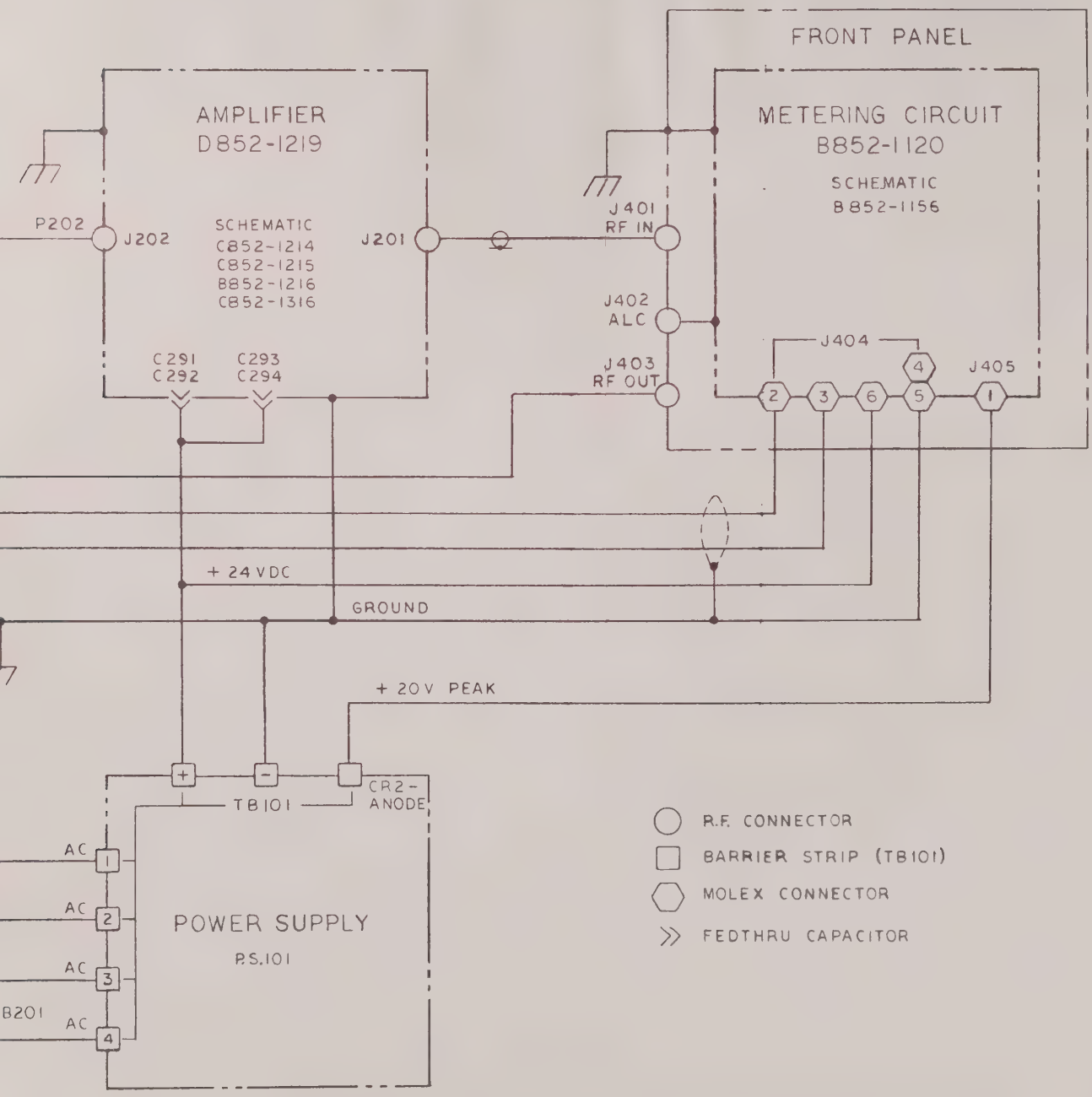
APP: [illegible] APP:
CHECKED BY: [illegible]
DRAWN BY: R. WIEN
SCALE: ——— WT: ——— DATE: 9-15-77
DRAWING NUMBER: D852-1220
REV:

D852-1220



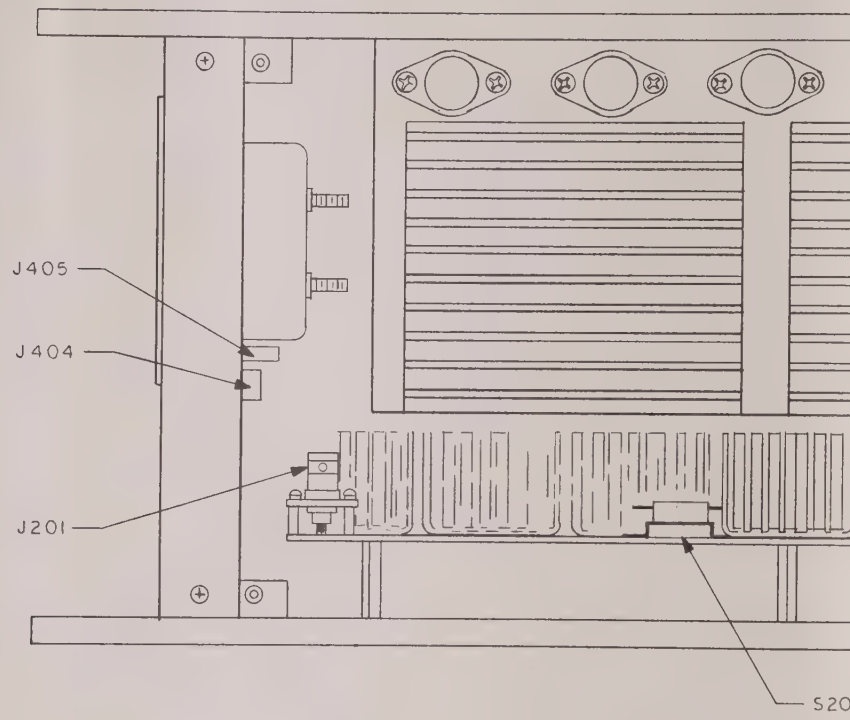
1. BREAK ALL SHARP EDGES
NOTES. UNLESS OTHERWISE SPECIFIED

LET	ECO	REVISION DESCRIPTION	BY	DATE	APP
A	8200	PER ECO	R.W.	9/9/77	



C852-1222 A

ITEM	QTY.	DESCRIPTION	SYMBOL	PART NO.
USED ON	QTY.	UNLESS OTHERWISE NOTED	AILTECH A CUTLER-HAMMER COMPANY	
20512	REF	CONCENTRICITY ——— T.I.R. SURFACE FINISH: ——— MICRO INCHES DEC. .XXX ± ——— .XX ± ——— FRAC. ± ——— ANG. ± ——— HOLE DIA. ———	TITLE: INTERCONNECT DRWG.	
			MATERIAL: ———	APP:
			SURFACE TREATMENT: ———	CHECKED BY:
				DRAWN BY: R. JEN
		COMMER. TOL. APPLY TO STOCK DIMENSIONS THREADS TO MIL-S-7742		SCALE: — WT. — DATE: 9-2-77
		These drawings and specifications are the property of AILTECH, are issued in strict confidence and shall not be divulged, be reproduced or copied, or used as the basis for the manufacture or sale of any article without written permission	DRAWING NUMBER: C852-1222	REV: A

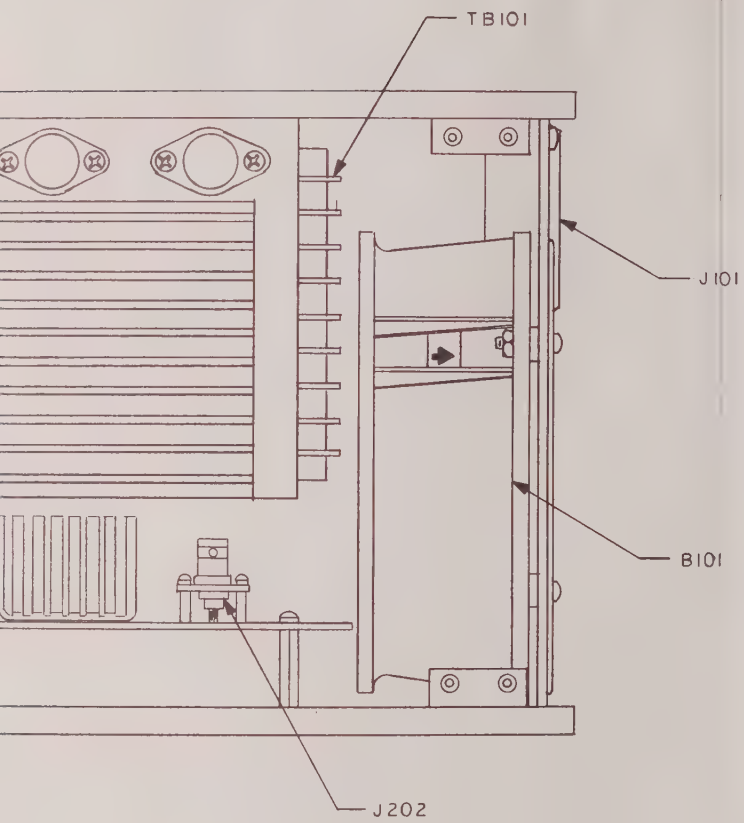


WIRE NO.	PART NO.	COLOR
105	———	1
106	———	3
107	———	4
108	———	6
109	———	5
110	B852-1332	0
111	B852-1332	2
112	B852-1332	3
113	B852-1332	6
115	———	2
116		2
119	———	5
	———	BLU (1) FAN
	———	BLU (2) FAN

(2) SHORTEN FAN LEADS (IN. LONG) ATTACH SOLDERLESS TERMINALS T&B # RA-2217, OR EQUIV.

NOTES: UNLESS OTHERWISE SPECIFIED
1. BREAK ALL SHARP EDGES

LET	ECO	REVISION DESCRIPTION	BY	DATE	APP



FROM	TO	
J101-"C"	TB101-AC(1)	
J101-"E"	TB101-AC(2)	
J101-"D"	TB101-AC(3)	
J101-"F"	TB101-AC(4)	
101-GND LUG	TB101-NEG.	
P205-1	T.P. GND (AMP.)	
P205-2	T.P. 101-POS.	
P205-3	T.P. 23 (AMP.)	
P205-4	TP 22 (AMP.)	
TB101-POS.	S201-1 (AMP)	
S201-2(AMP)	T.P.+24(AMP)	
T.P.GND(AMP)	TB101-NEG.	
B101	TB101-AC(1)	2
B101	TB101-AC(2)	2

ITEM	QTY.	DESCRIPTION	SYMBOL	PART NO.
USED ON	QTY.	UNLESS OTHERWISE NOTED	AILTECH A CUTLER-HAMMER COMPANY	
5001	1	CONCENTRICITY T.I.R.	TITLE: FINAL WIRE & HOOKUP	
		SURFACE FINISH: MICRO INCHES	MATERIAL	APP / APP
		DEC. XXX ± / XX ±		CHECKED BY
		FRAC. ±		DRAWN BY R. WIEN
		ANG. ±	SURFACE TREATMENT	SCALE / WT. / DATE 7-31-78
		HOLE DIA.		
		COMMER. TOL. APPLY TO STOCK DIMENSIONS THREADS TO MIL-S-7742		

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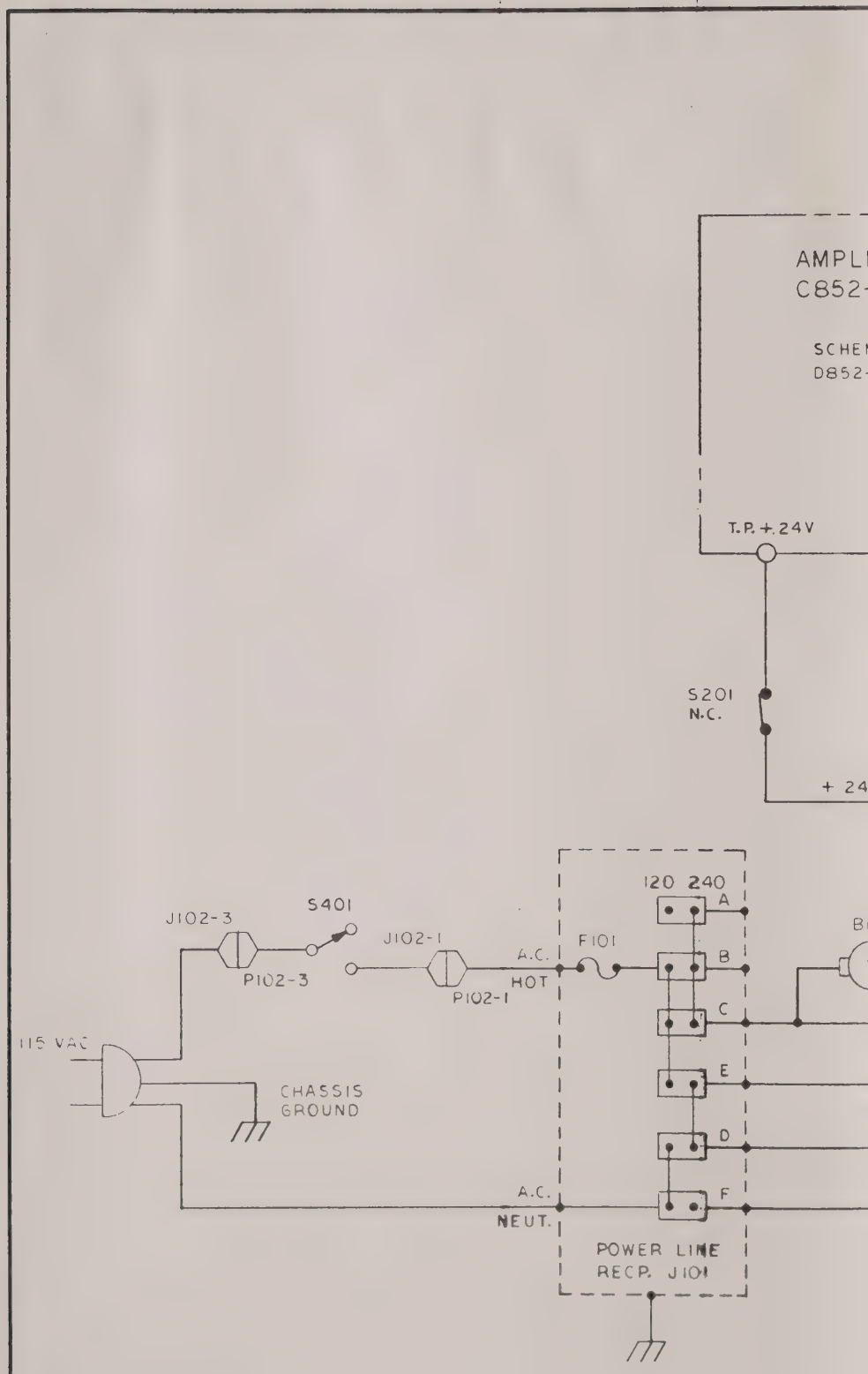
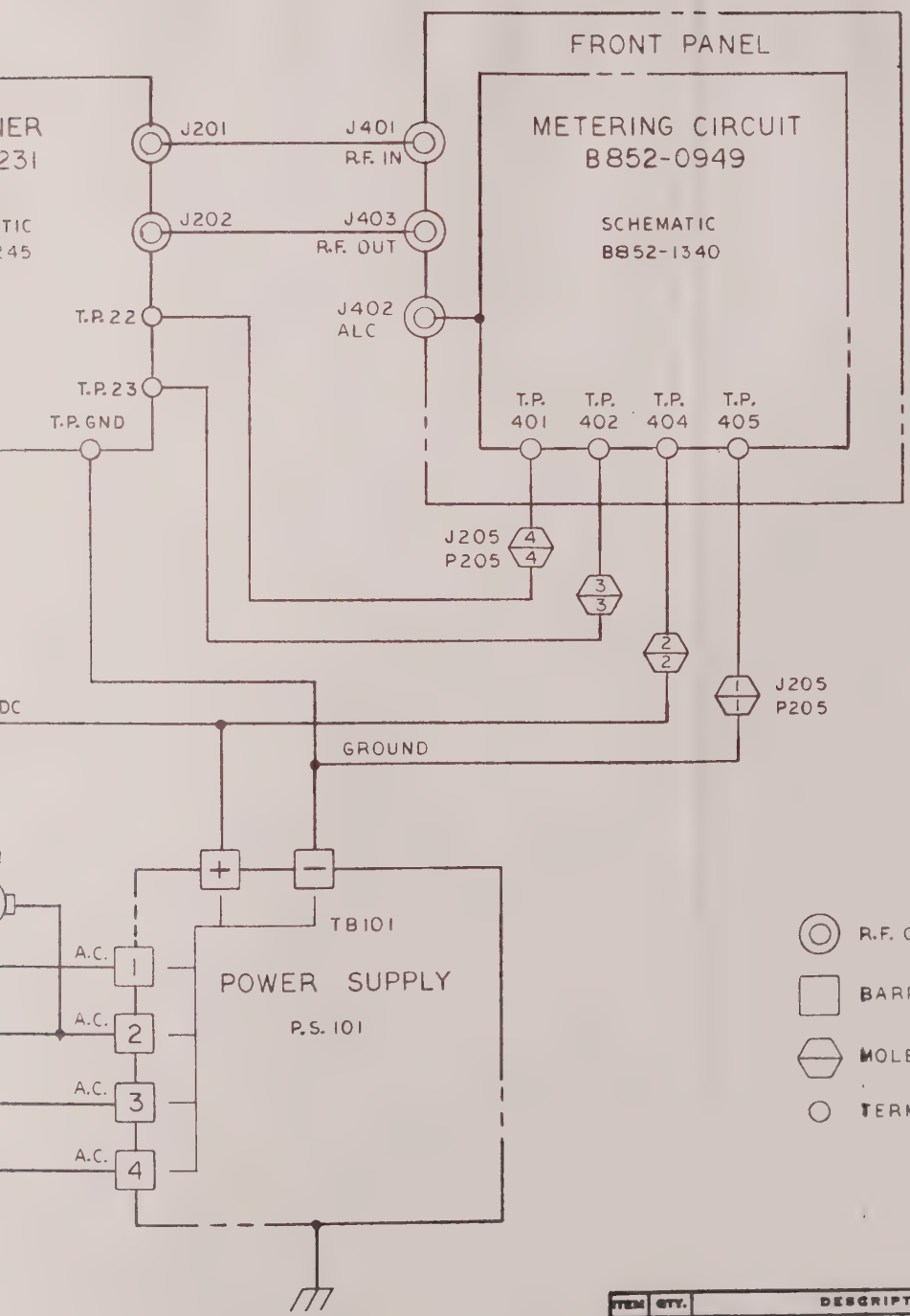
DRAWING NUMBER C852-1335 REV

C852-1335



1. BREAK ALL SHARP EDGES
NOTES: UNLESS OTHERWISE SPECIFIED

LET	ECO	REVISION DESCRIPTION	BY	DATE	APP



ITEM	QTY.	DESCRIPTION	SYMBOL	PART NO.
USED ON	QTY.	UNLESS OTHERWISE NOTED	AILTECH A CUTLER HAMMER COMPANY	
5001	REF	CONCENTRICITY T.I.R.	TITLE: INTERCONNECT DRWG.	
		SURFACE FINISH: MICRO INCHES	MATERIAL	APP / APP
		DEC. .XXX ± .XX ±		CHECKED BY
		FRAC. ±		DRAWN BY R. U IEN
		ANG. ±	SURFACE TREATMENT	SCALE / WT. / DATE 8-8-78
		HOLE DIA.		
		COMMER. TOL. APPLY TO STOCK DIMENSIONS THREADS TO MIL-S-7742		
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C852-1339

WARRANTY

Except for tubes, fuses, and batteries which carry no warranty, Cutler-Hammer, in connection with equipment sold, agrees to correct any defect in workmanship or material which may develop during the period of one year from the date of shipment under proper or normal use and not in excess of the original manufacturer's life expectancy ratings, by its option to repair or replace, FOB point of shipment, the defective part or parts, and such correction shall constitute a fulfillment of all Cutler-Hammer liabilities in respect to said apparatus.

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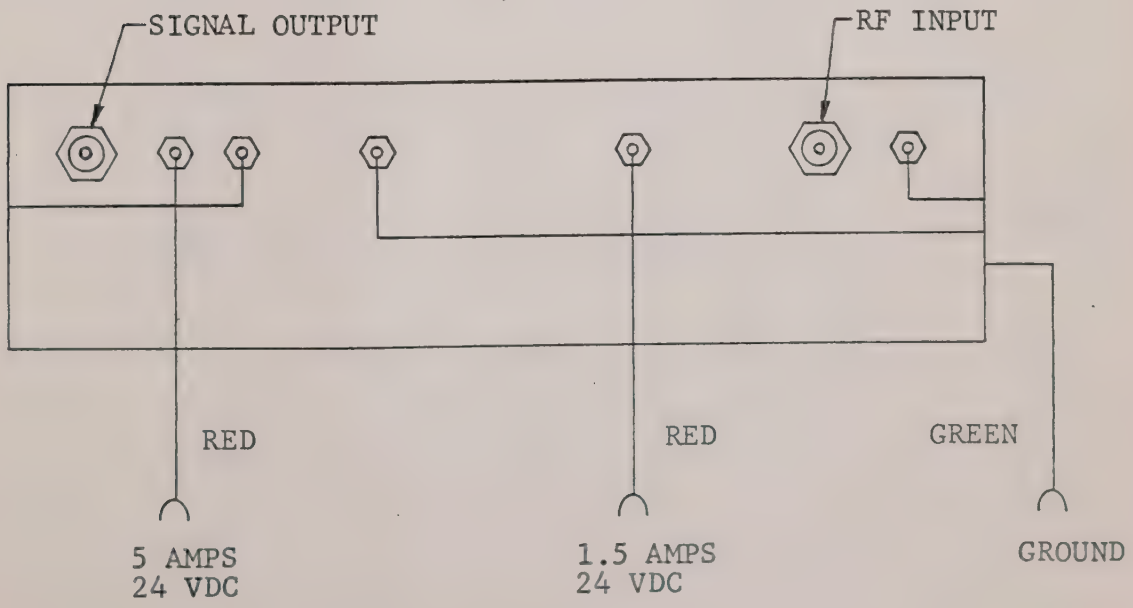
Amplifier Module ME 2020-2
Power Hookup Requirements

Specifications

Supply Voltage:	24 Vdc ±1% 7A (current limited to 7.5 A for overdrive protection)
Ventilation:	Forced air ventilation is required to keep the temperature of chassis below 60°C.
Input Drive:	4 watts maximum continuous, 10 watts absolute maximum for less than 10 seconds.
Gain:	10 dB minimum for rated 20 watts output power.
Gain Variation:	±1.5 dB (at all power levels up to 20 watts) 1-200 MHz.
Total Harmonic Distortion:	More than 25 dB down.
Input VSWR:	1.5:1 typical
Load Impedance:	Will deliver rated performance into load VSWR's as high as 1.5:1.



Amplifier Module ME 2020

Power Hookup Requirements

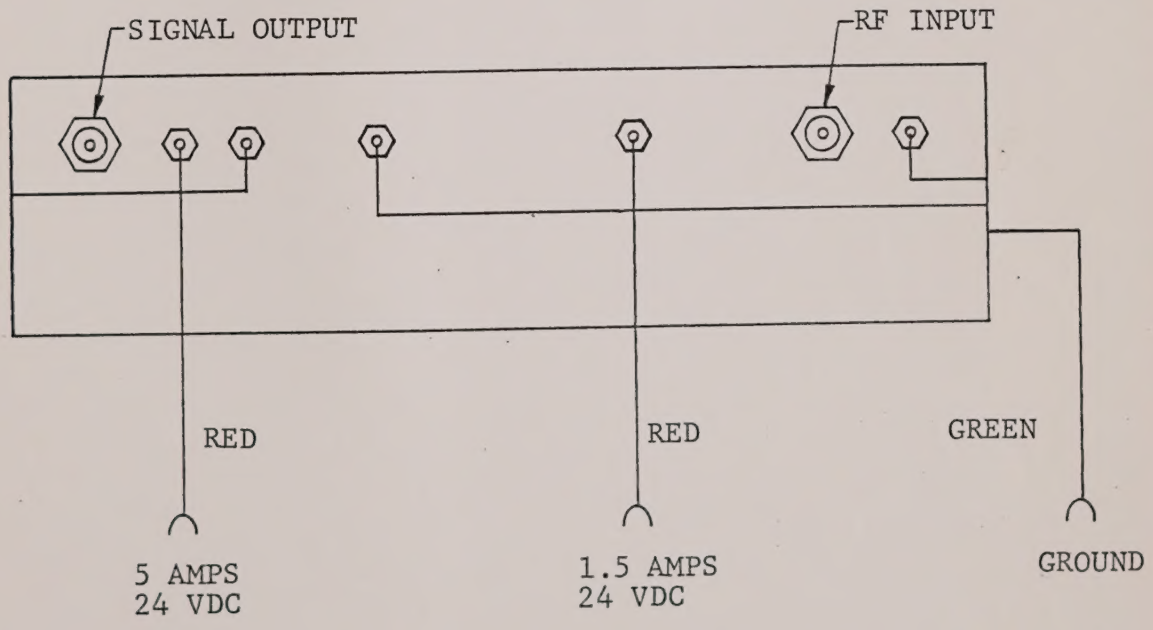
Specifications

Supply Voltage: 24 Vdc ±1% 7A (current limited to 7.5 A for overdrive protection)

Power hookup diagram is shown below.

Ventilation: Forced air ventilation is required to keep the temperature of module below 60 °C.

For complete table of specifications refer to Table 1 in the instruction manual for Broadband Amplifiers.



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